

Photometric Test Report

Relevant Standards

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

Prepared For

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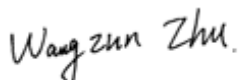
Test Date

2018/4/16

Issue Date

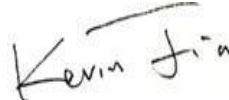
2018/4/16

Prepared By



Wangzun Zhu

Approved By



Kevin Jia

The results contained in this report pertain only to the tested sample.

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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	3242	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥85%	100.00%	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	110	114.8	P
Allowable CCTs* (K)	IES LM-79-2008	5700	3016	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	65	69.4	P
Power Factor	ANSI C82.77:2014	0.873	0.997	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	9.18%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/4/16	HBLED26Y	N1
2	Goniophotometer Test	2018/4/16	HBLED26Y	N1
3	THD and PF Test	2018/4/16	HBLED26Y	N1

Remark(If any)

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3.0 Production Description

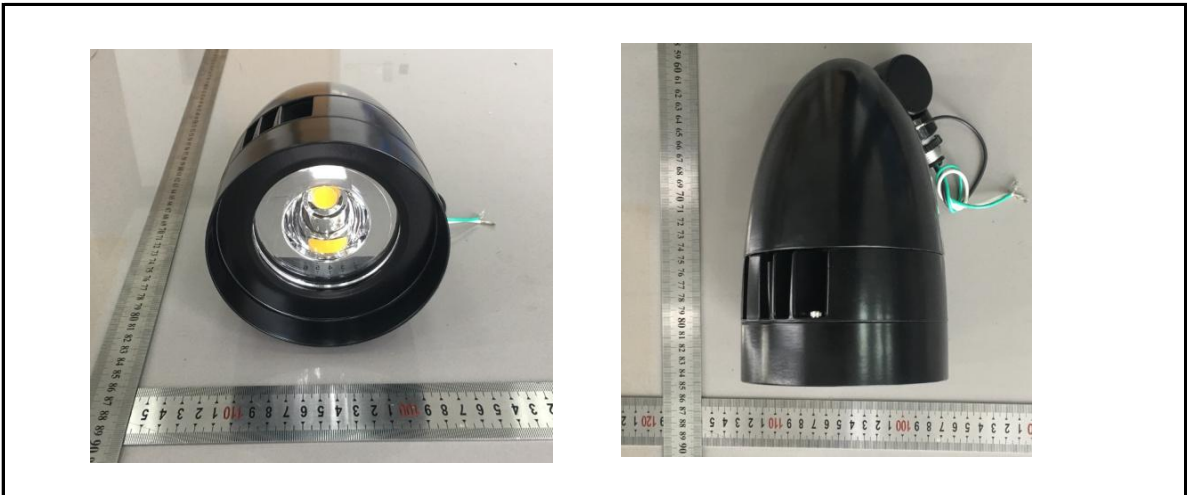
Luminaire Description:

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.	HBLED26Y	Sample ID.	N1
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	119.99	60	0.235	28.10	0.997

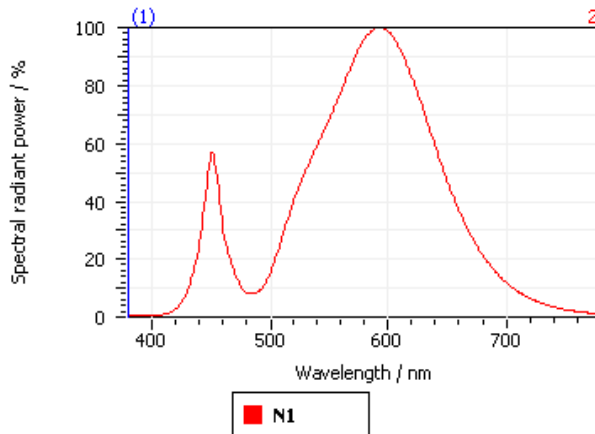
Test Result

CCT (K)	CRI (Ra)	Duv
3016	69.4	3.0E-03

4.1 Integrating Sphere Test

Spectroradiometric Parameters

Results



Spectral values

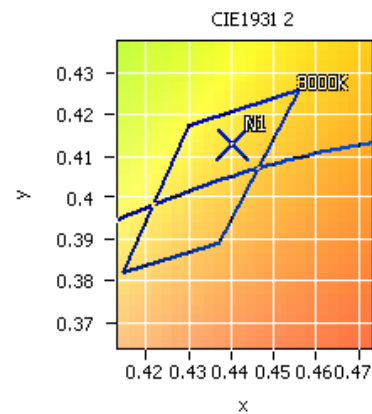
DominantWavelength	581.76 nm
Purity	0.560
PeakWavelength	593.12 nm
Width50%:	117.92 nm

Color Coordinates

Correlated Color Temperature 3016 K

x: 0.4402 u: 0.2489 u': 0.2489
y: 0.4128 v: 0.3502 v': 0.5252

ResultsCRICRI01	65.2	ResultsCRICRI09	-36.8
ResultsCRICRI02	79.3	ResultsCRICRI10	51.7
ResultsCRICRI03	91.4	ResultsCRICRI11	57.5
ResultsCRICRI04	64.9	ResultsCRICRI12	38.5
ResultsCRICRI05	63.5	ResultsCRICRI13	67.5
ResultsCRICRI06	70.2	ResultsCRICRI14	94.9
ResultsCRICRI07	78.3	ResultsCRICRI15	57.6
ResultsCRICRI08	42.7	ResultsCRICRI16	57.3
ResultsCRI	69.4		



Nominal CCT: 3000K

PlanckDistance 3.0E-003

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	HBLED26Y	Sample ID.	N1
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

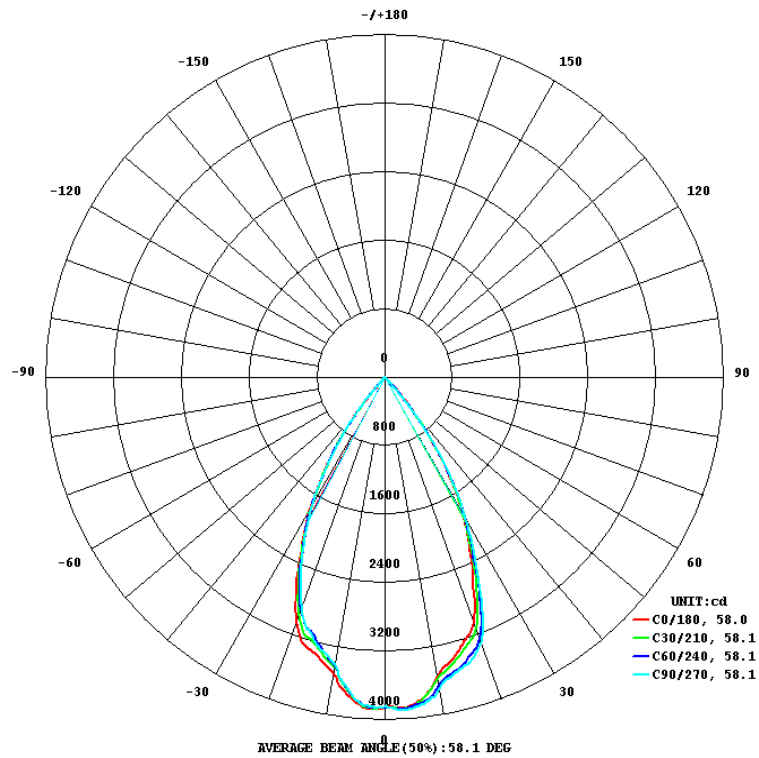
Temperature ($^{\circ}\text{C}$)	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	Orientation
25.1	277.01	60	0.111	28.24	0.923	Light Down

Test Result

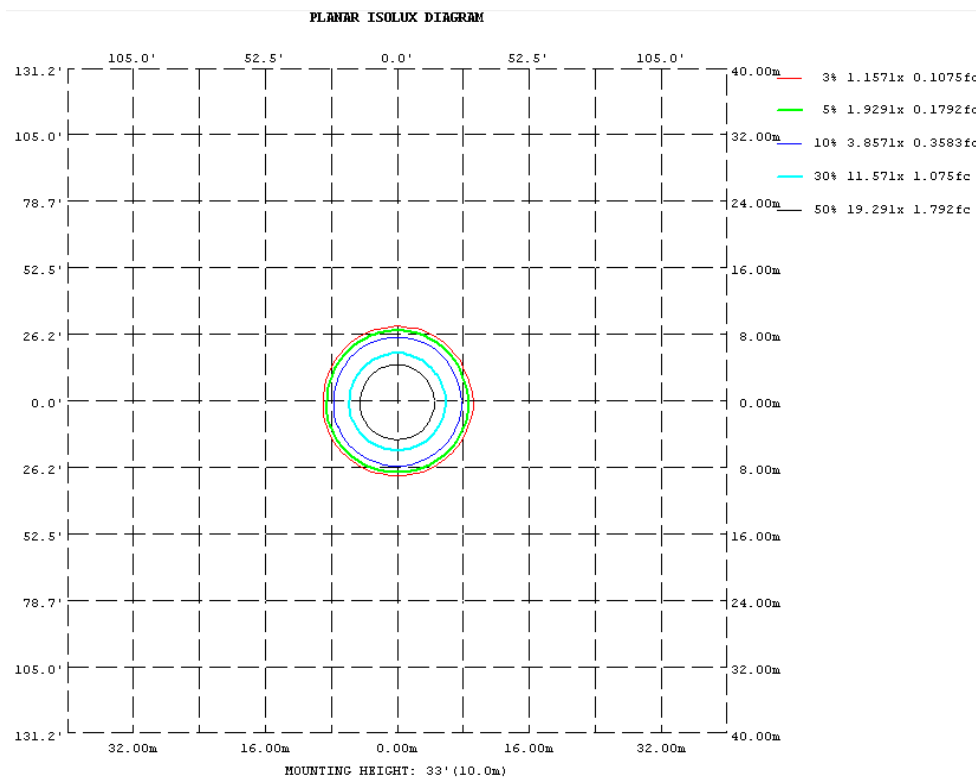
Flux(lm)	Zonal Lumen Requirement (0° - 90°)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
		Horizontal Spread	Vertical Spread	Horizontal Spread	Vertical Spread	
3242	100.00%	81.7	82.0	58.1	58	114.8

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	3559	3607	3692	3622	3522	3429	3409	3398
20	3067	3205	3309	3202	3055	2928	2884	2830
30	1852	1890	1910	1927	1789	1748	1741	1733
40	552.0	556.4	525.9	556.3	454.4	456.0	458.7	456.6
50	11.97	11.74	10.80	11.77	9.377	9.855	10.07	11.46
60	1.255	1.269	1.130	1.218	1.164	1.195	1.223	1.119
70	0.7872	0.8349	0.2941	0.7489	0.7142	0.7546	0.4281	0.7318
80	0.0325	0.0384	0.0852	0.0353	0.0218	0.0425	0.1883	0.0459
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 = 3.5 %

4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0 - 10	354.97	0 - 10	354.97	10.95%
10 - 20	930.58	0 - 20	1285.55	39.65%
20 - 30	1116.18	0 - 30	2401.73	74.08%
30 - 40	707.54	0 - 40	3109.27	95.91%
40 - 50	126.70	0 - 50	3235.97	99.81%
50 - 60	4.73	0 - 60	3240.70	99.96%
60 - 70	1.01	0 - 70	3241.71	99.99%
70 - 80	0.24	0 - 80	3241.95	100.00%
80 - 90	0.04	0 - 90	3241.99	100.00%
90 - 100	0.00	0 - 100	3241.99	100.00%
100 - 110	0.00	0 - 110	3241.99	100.00%
110 - 120	0.00	0 - 120	3241.99	100.00%
120 - 130	0.00	0 - 130	3241.99	100.00%
130 - 140	0.00	0 - 140	3241.99	100.00%
140 - 150	0.00	0 - 150	3241.99	100.00%
150 - 160	0.00	0 - 160	3241.99	100.00%
160 - 170	0.00	0 - 170	3241.99	100.00%
170 - 180	0.00	0 - 180	3241.99	100.00%

4.3 Goniophotometer Test

Axial Candela

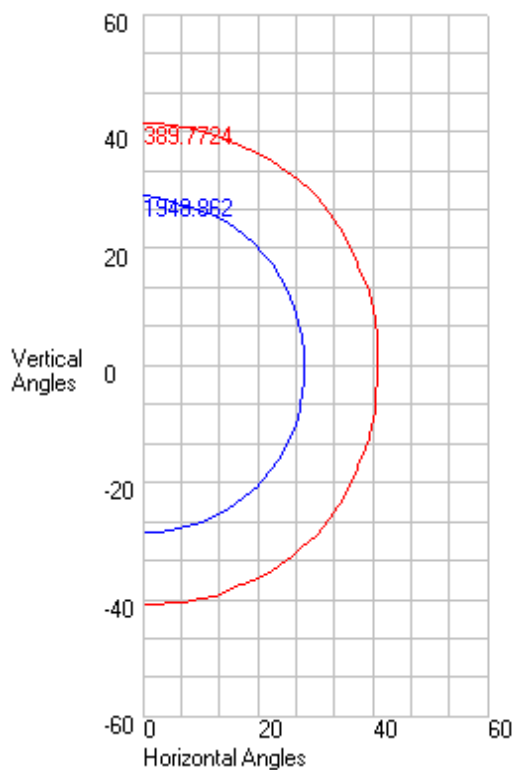
DEG.	HOR.	DEG.	VERT.
90	0	90	0.01
85	0.15	85	0.01
75	0.25	75	0.16
65	0.96	65	1.22
55	3.18	55	3.48
47.5	20.96	47.5	35.5
42.5	216.44	42.5	283.31
37.5	735.12	37.5	858.87
33	1336.9	33	1462.34
29	1862.26	29	1977.4
25.5	2261.15	25.5	2409.62
22.5	2592.8	22.5	2775.15
19.5	2937.81	19.5	3105.2
17	3094.98	17	3213.59
15	3198.17	15	3325.89
13	3282.02	13	3410.06
11	3360.06	11	3490.87
9	3513.54	9	3653.18
7	3665.08	7	3765.36
5	3797.67	5	3836.88
3	3843.48	3	3863.51
1	3855.68	1	3851.24
0	3852.249	0	3852.249
-1	3861.43	-1	3869.55
-3	3891.74	-3	3876.33
-5	3873.21	-5	3821.32
-7	3834.42	-7	3723.14
-9	3768	-9	3599.23
-11	3630.07	-11	3473.35
-13	3564.86	-13	3383.14
-15	3507.18	-15	3318.04
-17	3466.29	-17	3269.21
-19.5	3340.52	-19.5	3107.88
-22.5	3037.15	-22.5	2750.98
-25.5	2559.11	-25.5	2331.21
-29	2052.88	-29	1908.05
-33	1509.88	-33	1359
-37.5	870.5	-37.5	758.95
-42.5	204.01	-42.5	212.45
-47.5	27.91	-47.5	21.02
-55	2.99	-55	2.2
-65	0.85	-65	1.31
-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	3897.724
Maximum Candela Angle	-3 H -1 V
Horizontal Beam Angle (50%)	58
Vertical Beam Angle (50%)	58.1
Horizontal Field Angle (10%)	82
Vertical Field Angle (10%)	82.6
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	2303
Beam Efficiency	N.A.
Field Lumens	3156
Field Efficiency	N.A.
Spill Lumens	86
Luminaire Lumens	3242
Total Efficiency	N.A.
Total Luminaire Watts	28.2443
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	0.01	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	0.021	0.02	0.02	0.023	0.033	0.054	0.022	0	0
75	0.16	0.154	0.141	0.129	0.108	0.093	0.079	0.067	0.06	0.058	0.056	0.055	0.058	0.052	0.053	0.053	0.049	0.053	0.048	0.069	0.092	0.015	0
65	1.22	1.22	1.22	1.217	1.212	1.203	1.188	1.16	1.127	1.083	1.022	0.934	0.929	0.821	0.779	0.697	0.216	0.166	0.087	0.091	0.105	0.072	0
55	3.48	3.404	3.253	2.906	2.555	2.127	1.813	1.577	1.519	1.465	1.395	1.318	1.244	1.157	1.123	1.171	1.145	0.892	0.259	0.132	0.122	0.124	0
47.5	35.5	34.297	31.892	27.445	23.783	20.374	17.541	15.739	13.638	11.177	8.87	7.642	6.128	4.032	1.969	1.288	1.124	1.15	0.82	0.17	0.138	0.133	0
42.5	283.31	277.169	264.905	234.795	208.443	180.782	154.13	134.147	106.77	76.172	46.95	27.742	19.203	11.613	7.5	3.578	1.333	1.135	0.984	0.237	0.152	0.136	0
37.5	858.87	847.13	810.386	764.233	714.733	642.383	586.218	525.454	458.76	387.893	306.674	204.398	126.438	47.946	19.086	8.779	3.694	1.263	1.135	0.324	0.167	0.138	0
33	1462.34	1447.08	1400.71	1342.16	1269.70	1204.24	1137.85	1043.87	949.977	847.124	711.789	544.04	373.432	208.156	73.229	19.223	7.752	2.327	1.161	0.379	0.176	0.139	0
29	1977.4	1961.54	1911.81	1849.11	1773.48	1705.89	1628.16	1542.83	1426.22	1307.10	1140.98	935.871	700.929	457.786	208.414	47.076	11.201	4.654	1.187	0.418	0.191	0.14	0
25.5	2409.62	2387.43	2321.38	2241.75	2163.12	2102.43	2026.28	1930.17	1815.12	1691.01	1517.81	1271.95	1007.91	704.065	374.778	125.48	18.806	6.371	1.234	0.54	0.195	0.141	0
22.5	2775.15	2745.78	2662.62	2575.32	2508.31	2438.38	2344.42	2220.37	2107.16	1985.00	1802.05	1556.98	1270.26	939 *	549.647	206.756	26.8	7.95	1.29	0.709	0.205	0.142	0
19.5	3105.2	3078.41	3006.01	2914.69	2831.28	2729.64	2601.89	2507.96	2402.65	2238.30	2050.93	1800.60	1514.63	1136.86	718.061	309.262	44.911	9.258	1.344	0.841	0.213	0.143	0
17	3213.59	3193.95	3146.21	3097.78	3038.58	2947.15	2841.36	2718.95	2569.3	2456.37	2236.50	1982.87	1688.48	1303.70	851.595	389.148	73.022	10.927	1.409	0.882	0.216	0.144	0
15	3325.89	3303.15	3241.37	3178.00	3116.84	3057.18	2969.33	2856.15	2742.56	2567.96	2394.11	2103.69	1812.52	1423.66	951.585	458.149	109.799	13.158	1.512	0.911	0.219	0.145	0
13	3410.06	3387.72	3331.72	3275.42	3205.46	3122.52	3038.67	2947.19	2848.42	2706.51	2496.88	2214.43	1925.56	1536.59	1043.27	521.866	139.57	15.131	1.68	0.925	0.224	0.146	0
11	3490.87	3462.24	3390.31	3335.16	3273.52	3199.22	3102.55	3024.46	2939.82	2816.51	2590.82	2329.01	2021.29	1620.74	1136.93	579.403	160.34	16.819	2.052	0.937	0.229	0.146	0
9	3653.18	3608.36	3484.67	3407.59	3330.89	3257.34	3193.73	3105.81	3003.01	2902.03	2695.21	2419.29	2095.76	1701.53	1203.23	628.643	181.076	18.224	2.386	0.942	0.233	0.147	0
7	3765.36	3728.50	3642.14	3558.38	3406.18	3328.97	3265.46	3186.08	3076.25	2978.88	2778.16	2480.62	2152.01	1765.35	1248.96	677.115	197.027	19.337	2.696	0.947	0.238	0.148	0
5	3836.88	3808.34	3739.42	3643.92	3543.21	3392.22	3313.96	3245.39	3142.31	3039.55	2847.49	2527.95	2200.16	1812.4	1291.37	702.994	208.264	20.159	2.93	0.952	0.243	0.148	0
3	3863.51	3843.22	3793.78	3725.37	3617.47	3454.58	3339.61	3275.96	3182.96	3072.78	2897.99	2564.04	2238.31	1843.94	1320.28	724.274	219.746	21.011	3.177	0.956	0.246	0.149	0
1	3851.24	3853.85	3835.59	3795.51	3668.11	3512.97	3359.32	3283.41	3199.07	3091.26	2932.07	2589.08	2260.51	1861.88	1336.87	735.709	217.544	20.977	3.179	0.959	0.249	0.15	0
0	3852.24	3855.68	3843.48	3797.67	3665.08	3513.54	3360.06	3282.02	3198.17	3094.98	2937.81	2592.8	2261.15	1862.26	1336.9	735.12	216.44	20.96	3.18	0.96	0.25	0.15	0
-1	3869.55	3863.36	3846.39	3793.84	3669.60	3519.32	3364.54	3279.49	3195.93	3096.38	2938.93	2596.48	2262.43	1862.76	1336.87	735.91	216.664	20.922	3.184	0.958	0.248	0.15	0
-3	3876.33	3863.50	3819.48	3747.12	3631.32	3467.64	3349.61	3261.34	3178.14	3089.34	2919.47	2583.56	2244.31	1846.63	1320.23	724.865	217.111	20.847	3.193	0.954	0.245	0.149	0
-5	3821.32	3814.83	3756.53	3672.64	3568.06	3411.51	3319.48	3233.21	3147.06	3070.97	2886.63	2553.18	2210.81	1817.02	1291.17	703.945	204.347	19.907	2.941	0.949	0.242	0.148	0
-7	3723.14	3715.69	3658.37	3575.93	3436.54	3351.23	3270.42	3185.35	3104.59	3033.59	2833.28	2511.08	2165.93	1772.25	1248.40	678.391	192.182	19.014	2.691	0.943	0.237	0.148	0
-9	3599.23	3581.43	3502.03	3429.04	3365.35	3275.56	3216.44	3135.31	3072.95	2974.54	2759.85	2447.62	2108.01	1711.78	1202.14	630.901	175.919	17.86	2.346	0.937	0.232	0.147	0
-11	3473.35	3454.35	3405.39	3371.10	3307.36	3230.73	3167.54	3116.26	3034.54	2895.56	2661.40	2357.74	2033.30	1634.01	1135.47	580.071	155.646	16.452	2.001	0.93	0.228	0.146	0
-13	3383.14	3375.08	3346.15	3297.41	3232.87	3183.27	3144.43	3063.69	2942.21	2787.93	2544.22	2241.65	1939.88	1547.19	1043.79	521.824	135.864	14.804	1.62	0.917	0.223	0.146	0
-15	3318.04	3305.24	3267.65	3223.85	3190.88	3151.99	3074.03	2957.33	2827.31	2646.33	2432.52	2125.16	1829.80	1427.55	953.043	457.618	108.621	12.918	1.463	0.902	0.219	0.145	0
-17	3269.21	3253.15	3214.86	3177.36	3126.96	3045.26	2939.34	2810.22	2654.74	2501.72	2269.68	2001.30	1704.72	1306.41	854.647	388.132	74.808	10.813	1.366	0.867	0.216	0.144	0
-19.5	3107.88	3097.61	3055.17	2997.37	2918.17	2822.86	2703.02	2579.31	2452.43	2274.66	2077.94	1817.87	1520.61	1139.74	720.352	305.175	43.244	8.985	1.295	0.812	0.213	0.143	0
-22.5	2750.98	2743.69	2706.91	2656.86	2600.36	2514.42	2401.17	2262.35	2143.18	2008.49	1820.02	1564.43	1273.88	947.759	545.934	200.828	26.264	7.677	1.23	0.587	0.205	0.142	0
-25.5	2331.21	2330.19	2306.62	2263.79	2208.16	2140.76	2057.40	1955.98	1839.80	1712.13	1524.09	1276.28	1020.56	710.132	373.174	126.371	17.948	6.166	1.188	0.449	0.195	0.141	0
-29	1908.05	1906.93	1887.40	1854.21	1804.43	1736.75	1653.09	1557.95	1434.65	1314.54	1148.62	952.657	711.147	456.094	204.271	42.733	10.664	4.621	1.158	0.415	0.191	0.14	0
-33	1359 *	1358.68	1341.55	1311.94	1268.46	1220.66	1151.82	1058.68	968.045	866.287	724.597	545.564	372.063	204.819	68.41	18.321	7.232	2.112	1.137	0.393	0.176	0.139	0
-37.5	758.95	759.122	746.928	724.754	697.72	646.864	592.134	527.856	458.542	383.946	301.743	198.341	120.684	37.643	18.283	8.222	3.947	1.298	1.119	0.322	0.167	0.138	0
-42.5	212.45	212.828	213.583	199.734	187.019	170.374	149.725	129.471	101.797	68.333	36.025	25.49	17.803	10.486	6.974	3.71	1.39	1.144	0.964	0.211	0.152	0.136	0
-47.5	21.02	20.999	20.958	20.001	19.096	17.922	16.492	14.835	12.893	10.684	8.544	7.508	5.272	3.867	1.715	1.374	1.168	1.199	0.777	0.165	0.138	0.133	0
-55	2.2	2.208	2.224	2.077	1.939	1.753	1.636	1.49	1.447	1.408	1.357	1.284	1.211	1.168	1.175	1.26	1.228	0.915	0.249	0.133	0.122	0.124	0
-65	1.31	1.313	1.319	1.304	1.289	1.266	1.236	1.198	1.15	1.089	1.004	0.963	0.919	0.791	0.781	0.67	0.213	0.166	0.087	0.091	0.105	0.06	0
-75	0.05	0.051	0.052	0.053	0.054	0.054	0.053	0.052	0.05	0.052	0.053	0.054	0.05	0.05	0.046	0.046	0.049	0.046	0.045	0.069	0.092	0.01	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	0.021	0.02	0.02	0.023	0.033	0.035	0.006	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	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	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		0.2	0.5	0.4	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		0.87 *	1.70 *	1.62 *	1.52 *	1.40 *	1.27 *	1.1	1	0.8	0.8	0.7	0.4	0.3	0.1	0.1	0	0	0	0	0	0	0	
37.5		1.59 *	3.12 *	3.03 *	2.90 *	2.74 *	2.56 *	2.36 *	2.13 *	1.88 *	1.99 *	1.85 *	1.3	0.9	0.4	0.2	0.1	0	0	0	0	0	0	
33		2.09 *	4.13 *	4.03 *	3.90 *	3.74 *	3.56 *	3.34 *	3.09 *	2.81 *	3.09 *	3.05 *	2.32 *	1.81 *	1.1	0.4	0.1	0	0	0	0	0	0	
29		2.33 *	4.62 *	4.52 *	4.38 *	4.22 *	4.05 *	3.86 *	3.62 *	3.35 *	3.76 *	3.84 *	3.06 *	2.58 *	1.75 *	0.8	0.2	0	0	0	0	0	0	
25.5		2.36 *	4.68 *	4.57 *	4.45 *	4.31 *	4.16 *	3.96 *	3.73 *	3.47 *	3.96 *	4.13 *	3.38 *	2.98 *	2.18 *	1.1	0.4	0.1	0	0	0	0	0	
22.5		2.68 *	5.31 *	5.21 *	5.09 *	4.95 *	4.77 *	4.55 *	4.29 *	4.01 *	4.58 *	4.83 *	4.05 *	3.67 *	2.82 *	1.63 *	0.6	0.1	0	0	0	0	0	
19.5		2.40 *	4.78 *	4.72 *	4.64 *	4.53 *	4.38 *	4.20 *	4.00 *	3.75 *	4.28 *	4.51 *	3.83 *	3.54 *	2.81 *	1.73 *	0.7	0.1	0	0	0	0	0	
17		1.99 *	3.96 *	3.93 *	3.87 *	3.79 *	3.70 *	3.58 *	3.43 *	3.24 *	3.72 *	3.92 *	3.32 *	3.11 *	2.53 *	1.61 *	0.7	0.1	0	0	0	0	0	
15		2.05 *	4.08 *	4.03 *	3.97 *	3.89 *	3.81 *	3.71 *	3.59 *	3.42 *	3.94 *	4.17 *	3.54 *	3.34 *	2.75 *	1.80 *	0.8	0.2	0	0	0	0	0	
13		2.10 *	4.17 *	4.13 *	4.07 *	3.99 *	3.90 *	3.80 *	3.70 *	3.55 *	4.14 *	4.40 *	3.75 *	3.54 *	2.96 *	1.98 *	0.9	0.2	0	0	0	0	0	
11		2.17 *	4.30 *	4.22 *	4.15 *	4.07 *	3.98 *	3.89 *	3.79 *	3.66 *	4.30 *	4.61 *	3.93 *	3.71 *	3.13 *	2.13 *	1	0.2	0	0	0	0	0	
9		2.25 *	4.45 *	4.36 *	4.26 *	4.15 *	4.07 *	3.98 *	3.87 *	3.74 *	4.42 *	4.78 *	4.07 *	3.85 *	3.26 *	2.26 *	1.05 *	0.2	0	0	0	0	0	
7		2.31 *	4.58 *	4.50 *	4.40 *	4.26 *	4.14 *	4.05 *	3.94 *	3.81 *	4.52 *	4.91 *	4.19 *	3.96 *	3.37 *	2.36 *	1.11 *	0.2	0	0	0	0	0	
5		2.34 *	4.66 *	4.59 *	4.50 *	4.36 *	4.21 *	4.09 *	3.98 *	3.85 *	4.59 *	5.00 *	4.28 *	4.05 *	3.46 *	2.43 *	1.16 *	0.3	0	0	0	0	0	
3		2.35 *	4.69 *	4.65 *	4.56 *	4.43 *	4.26 *	4.12 *	4.00 *	3.88 *	4.63 *	5.05 *	4.34 *	4.11 *	3.51 *	2.47 *	1.18 *	0.3	0	0	0	0	0	
1		1.17 *	2.35 *	2.34 *	2.30 *	2.23 *	2.14 *	2.06 *	2.00 *	1.94 *	2.32 *	2.54 *	2.18 *	2.07 *	1.76 *	1.25 *	0.59 *	0.1	0	0	0	0	0	
0																								

-1	1.18 *	2.35 *	2.34 *	2.30 *	2.23 *	2.14 *	2.06 *	2.00 *	1.94 *	2.32 *	2.54 *	2.18 *	2.07 *	1.77 *	1.25 *	0.59 *	0.1	0	0	0	0	0	
-3	2.36 *	4.71 *	4.67 *	4.58 *	4.44 *	4.27 *	4.12 *	4.00 *	3.88 *	4.63 *	5.06 *	4.34 *	4.12 *	3.51 *	2.48 *	1.18 *	0.3	0	0	0	0	0	
-5	2.35 *	4.68 *	4.62 *	4.53 *	4.38 *	4.21 *	4.09 *	3.97 *	3.85 *	4.60 *	5.01 *	4.29 *	4.07 *	3.47 *	2.43 *	1.15 *	0.3	0	0	0	0	0	
-7	2.30 *	4.60 *	4.54 *	4.43 *	4.28 *	4.15 *	4.04 *	3.93 *	3.81 *	4.54 *	4.93 *	4.21 *	3.99 *	3.39 *	2.37 *	1.11 *	0.2	0	0	0	0	0	
-9	2.23 *	4.46 *	4.40 *	4.29 *	4.18 *	4.08 *	3.99 *	3.88 *	3.76 *	4.45 *	4.81 *	4.10 *	3.87 *	3.28 *	2.27 *	1.04 *	0.2	0	0	0	0	0	
-11	2.16 *	4.30 *	4.26 *	4.19 *	4.10 *	4.02 *	3.93 *	3.82 *	3.69 *	4.33 *	4.65 *	3.96 *	3.74 *	3.15 *	2.15 *	1	0.2	0	0	0	0	0	
-13	2.09 *	4.18 *	4.16 *	4.10 *	4.03 *	3.96 *	3.87 *	3.75 *	3.59 *	4.18 *	4.45 *	3.78 *	3.57 *	2.98 *	1.99 *	0.9	0.2	0	0	0	0	0	
-15	2.04 *	4.09 *	4.07 *	4.03 *	3.97 *	3.89 *	3.79 *	3.64 *	3.46 *	4.00 *	4.23 *	3.57 *	3.37 *	2.78 *	1.81 *	0.8	0.1	0	0	0	0	0	
-17	2.01 *	4.01 *	3.99 *	3.95 *	3.89 *	3.79 *	3.66 *	3.49 *	3.29 *	3.78 *	3.97 *	3.36 *	3.14 *	2.55 *	1.62 *	0.6	0.1	0	0	0	0	0	
-20	2.43 *	4.85 *	4.82 *	4.76 *	4.65 *	4.49 *	4.30 *	4.08 *	3.82 *	4.35 *	4.57 *	3.87 *	3.58 *	2.84 *	1.74 *	0.6	0.1	0	0	0	0	0	
-23	2.68 *	5.36 *	5.33 *	5.24 *	5.10 *	4.90 *	4.65 *	4.38 *	4.08 *	4.65 *	4.89 *	4.09 *	3.72 *	2.85 *	1.62 *	0.5	0.1	0	0	0	0	0	
-26	2.33 *	4.66 *	4.63 *	4.55 *	4.43 *	4.26 *	4.04 *	3.79 *	3.53 *	4.02 *	4.18 *	3.43 *	3.03 *	2.21 *	1.1	0.3	0.1	0	0	0	0	0	
-29	2.26 *	4.54 *	4.51 *	4.43 *	4.30 *	4.13 *	3.93 *	3.68 *	3.40 *	3.81 *	3.89 *	3.11 *	2.62 *	1.75 *	0.8	0.2	0	0	0	0	0	0	
-33	2.00 *	4.00 *	3.97 *	3.90 *	3.78 *	3.62 *	3.40 *	3.14 *	2.85 *	3.13 *	3.09 *	2.35 *	1.82 *	1.1	0.4	0.1	0	0	0	0	0	0	
-38	1.46 *	2.92 *	2.89 *	2.84 *	2.74 *	2.59 *	2.38 *	2.15 *	1.91 *	2.02 *	1.86 *	1.3	0.9	0.4	0.1	0.1	0	0	0	0	0	0	
-43	0.74 *	1.50 *	1.48 *	1.44 *	1.37 *	1.26 *	1.1	1	0.8	0.8	0.7	0.4	0.2	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	0.1	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	0.1	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	66	132	130	127	124	119	115	109	103	119	125	104	95	76	49	21	4.1	0.8	0.2	0	0	0	1621

5.0 THD and PF Test

Model No.	HBLED26Y	Sample ID.	N1
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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	119.99	60	0.235	28.10	0.997	5.29%
25.1	276.99	60	0.111	28.40	0.928	9.18%

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*****