



Photometric Test Report

Relevant Standards

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

Prepared For RAB Lighting Inc.

Room 6A33, No.1388, Wuzhong road, Shanghai, China

Xiao Xiang, 15921313292, gary@rabweb.com

Prepared By

Deliver Co., Ltd.

Block 11, 78 Keling Road, SSTP, Suzhou, China

0512-66801950, kevin.jia@szdeliver.com

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Prepared By

Wangzun Zhu

Wangzun Zhu

Approved By

Kevin Jia

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	1799	P
Zonal Lumen Requirement (0°-90°)	IES LM-79-2008	≥85%	100.00%	P
Minimum Luminaire Efficacy (lm/W)	IES LM-79-2008	110	115.3	P
Allowable CCTs* (K)	IES LM-79-2008	5700	5084	P
Minimum CRI	IES LM-79-2008 CIE 13.3-1995	70	72	P
Power Factor	ANSI C82.77:2014	0.873	0.933	P
Total Harmonic Distortion (A%)	ANSI C82.77:2014	25.00%	11.04%	P

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2018/4/16	HBLED13	G1
2	Goniophotometer Test	2018/4/16	HBLED13	G1
3	THD and PF Test	2018/4/16	HBLED13	G1

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

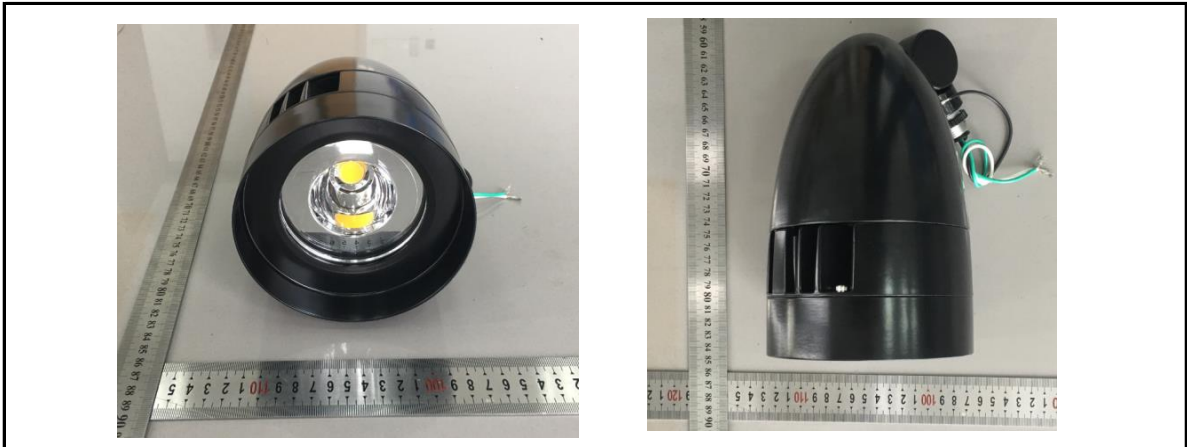
Luminaire Description: HBLED13

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.	HBLED13	Sample ID.	G1
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	276.93	60	0.060	15.60	0.933

Test Result

CCT (K)	CRI (Ra)	Duv
5084	72.0	2.3E-03

4.0 LM-79 Measurement and Test Results

4.3 Goniophotometer Test

Model No.	HBLED13	Sample ID.	G1
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	277.06	60	0.060	15.60	0.933	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	
1799	100.00%	82.0	81.7	56.7	57.1	115.3



4.3 Goniophotometer Test

ZONAL LUMEN SUMMARY

	Zonal (lm)		Total (lm)	Percent
0 - 10	201.90	0 - 10	201.90	11.22%
10 - 20	520.82	0 - 20	722.73	40.17%
20 - 30	612.23	0 - 30	1334.96	74.21%
30 - 40	387.01	0 - 40	1721.96	95.72%
40 - 50	71.69	0 - 50	1793.66	99.71%
50 - 60	4.14	0 - 60	1797.79	99.93%
60 - 70	0.96	0 - 70	1798.76	99.99%
70 - 80	0.20	0 - 80	1798.95	100.00%
80 - 90	0.01	0 - 90	1798.96	100.00%
90 - 100	0.00	0 - 100	1798.96	100.00%
100 - 110	0.00	0 - 110	1798.96	100.00%
110 - 120	0.00	0 - 120	1798.96	100.00%
120 - 130	0.00	0 - 130	1798.96	100.00%
130 - 140	0.00	0 - 140	1798.96	100.00%
140 - 150	0.00	0 - 150	1798.96	100.00%
150 - 160	0.00	0 - 160	1798.96	100.00%
160 - 170	0.00	0 - 170	1798.96	100.00%
170 - 180	0.00	0 - 180	1798.96	100.00%

4.3 Goniophotometer Test

Axial Candela

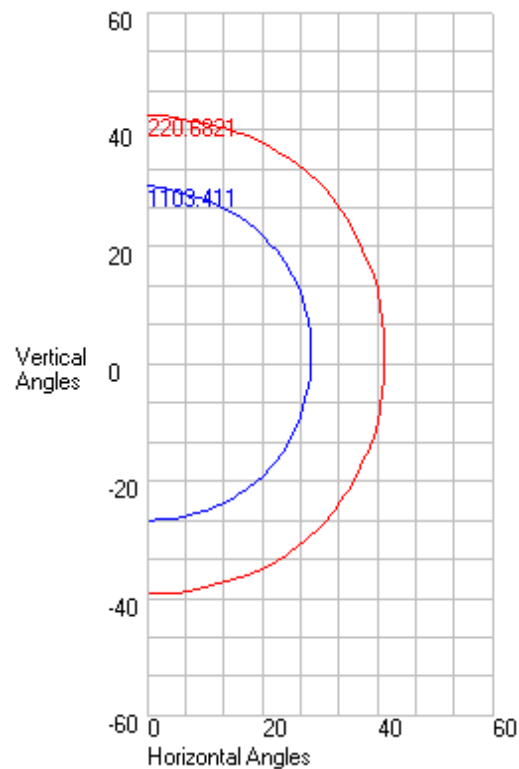
DEG.	HOR.	DEG.	VERT.
90	0	90	0
85	0	85	0
75	0.114	75	0.042
65	1.132	65	0.779
55	3.168	55	3.718
47.5	19.081	47.5	35.72
42.5	147.576	42.5	215.827
37.5	452.542	37.5	568.002
33	789.283	33	920.759
29	1069.799	29	1202.033
25.5	1309.775	25.5	1447.317
22.5	1481.822	22.5	1673.064
19.5	1708.951	19.5	1802.785
17	1813.099	17	1872.646
15	1875.233	15	1924.269
13	1935.404	13	1978.685
11	1986.07	11	2056.41
9	2071.917	9	2132.451
7	2139.899	7	2183.731
5	2180.958	5	2206.821
3	2204.598	3	2199.644
1	2200.464	1	2193.671
0	2196.61	0	2196.61
-1	2198.74	-1	2196.31
-3	2202.033	-3	2187.605
-5	2186.338	-5	2137.707
-7	2133.48	-7	2068.957
-9	2053.844	-9	1961.599
-11	1967.779	-11	1905.24
-13	1925.204	-13	1850.668
-15	1874.973	-15	1780.432
-17	1823.943	-17	1703.092
-19.5	1737.286	-19.5	1554.457
-22.5	1537.226	-22.5	1380.406
-25.5	1323.787	-25.5	1184.261
-29	1071.481	-29	940.307
-33	768.488	-33	634.592
-37.5	433.275	-37.5	307.501
-42.5	120.165	-42.5	66.112
-47.5	17.066	-47.5	9.078
-55	3.417	-55	1.568
-65	1.153	-65	0.696
-75	0.062	-75	0.042
-85	0	-85	0
-90	0	-90	0

4.3 Goniophotometer Test

Characteristics

NEMA Type	5 H x 5 V
Maximum Candela	2206.821
Maximum Candela Angle	0 H 5 V
Horizontal Beam Angle (50%)	56.7
Vertical Beam Angle (50%)	57.1
Horizontal Field Angle (10%)	82
Vertical Field Angle (10%)	81.7
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	1253
Beam Efficiency	N.A.
Field Lumens	1740
Field Efficiency	N.A.
Spill Lumens	58
Luminaire Lumens	1799
Total Efficiency	N.A.
Total Luminaire Watts	15.556
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	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	0
75	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.042	0.038	0.031	0.031	0.031	0.029	0.021	0.021	0.021	0.01	0	0	0	0
65	0.779	0.784	0.795	0.796	0.796	0.793	0.787	0.77	0.757	0.751	0.748	0.75	0.71	0.665	0.614	0.549	0.499	0.16	0.095	0.021	0	0	0
55	3.718	3.709	3.69	3.582	3.449	3.252	2.989	2.728	2.495	2.164	1.677	1.43	1.327	1.209	1.102	1.035	0.994	0.954	0.59	0.101	0.01	0	0
47.5	35.72	34.422	31.829	27.483	24.115	21.11	18.665	17.144	15.513	13.743	11.37	8.697	6.956	5.211	3.407	1.62	1.223	1.068	0.974	0.163	0.021	0	0
42.5	215.827	212.478	205.786	185.995	167.029	144.465	120.79	102.821	84.695	64.457	41.443	23.162	19.275	13.435	7.867	4.595	1.984	1.233	1.024	0.521	0.021	0	0
37.5	568.002	563.042	545.602	522.247	496.111	456.334	424.399	387.205	344.521	298.337	244.269	166.706	95.427	40.773	18.96	9.174	4.488	1.619	1.059	0.608	0.028	0	0
33	920.759	913.924	891.306	862.009	824.136	786.845	746.904	694.182	641.51	587.475	506.979	398.46	286.192	165.596	57.862	18.622	7.696	3.09	1.145	0.729	0.031	0	0
29	1202.03	1194.97	1171.31	1140.17	1098.95	1060.90	1020.59	975.639	912.366	842.706	747.31	630.166	489.736	336.103	161.307	40.503	12.403	4.888	1.273	0.826	0.033	0	0
25.5	1447.31	1440.69	1418.02	1386.04	1342.06	1299.12	1247.26	1189.16	1121.89	1049.79	950.114	812.098	667.199	484.937	274.966	86.411	18.091	6.49	1.401	0.958	0.047	0	0
22.5	1673.06	1664.26	1631.99	1586.47	1528.56	1473.58	1431.34	1379.22	1302.83	1218.93	1103.24	962.81	806.684	619.504	381.654	152.09	23.559	7.971	1.527	1.021	0.076	0	0
19.5	1802.78	1801.38	1791.74	1771.86	1745.61	1703.69	1636.89	1537.22	1449.43	1381.25	1258.63	1095.43	934.189	729.452	483.699	221.154	38.617	9.549	1.708	1.073	0.096	0	0
17	1872.64	1869.30	1854.46	1836.29	1824.24	1809.48	1768.51	1695.96	1596.68	1477.85	1374.51	1206.06	1025.39	816.292	558.563	270.984	56.642	11.96	2.024	1.082	0.103	0	0
15	1924.26	1922.17	1911.44	1898.99	1877.76	1844.85	1817.47	1775.90	1702.35	1583.71	1434.47	1283.08	1093.88	876.874	612.101	312.993	75.616	13.613	2.264	1.089	0.109	0	0
13	1978.68	1972.40	1952.34	1941.95	1930.19	1901.89	1856.03	1812.82	1761.45	1668.26	1502.49	1350.86	1158.31	931.376	659.314	350.113	90.448	15.063	2.477	1.094	0.111	0	0
11	2056.41	2040.01	1997.55	1988.30	1965.62	1943.47	1906.78	1844.57	1794.82	1725.24	1578.91	1398.25	1210.25	973.337	705.855	383.163	102	16.304	2.649	1.101	0.112	0	0
9	2132.45	2123.35	2094.25	2049.48	2000.03	1965.61	1927.76	1872.89	1815.57	1759.01	1637.66	1424.76	1251.46	1011.75	739.041	410.082	117.268	17.331	2.813	1.106	0.113	0	0
7	2183.73	2175.78	2155.60	2130.83	2061.64	1987.35	1936.50	1888.67	1833.17	1776.53	1674.66	1453.67	1281.93	1039.84	759.229	434.675	130.874	18.08	2.975	1.111	0.114	0	0
5	2206.82	2203.06	2191.1	2176.57	2115.17	2021.53	1956.39	1901.50	1847.27	1784.44	1695.49	1475.9	1302.05	1058.75	777.672	445.477	140.604	18.6	3.087	1.118	0.116	0	0
3	2199.64	2205.28	2199.70	2185.84	2132.30	2061.95	1970.19	1913.67	1860.39	1798.91	1706.34	1487.82	1312.49	1069.92	788.339	453.377	150.586	19.206	3.198	1.124	0.115	0	0
1	2193.67	2199.63	2206.33	2186.62	2143.47	2074.05	1985.12	1931.06	1873.06	1810.79	1711.84	1488.91	1314.34	1073.32	792.052	455.32	148.58	19.122	3.178	1.129	0.114	0	0
0	2196.61	2200.46	2204.59	2180.95	2139.89	2071.91	1986.07	1935.40	1875.23	1813.09	1708.95	1481.82	1309.77	1069.79	789.283	452.542	147.576	19.081	3.168	1.132	0.114	0	0
-1	2196.31	2198.50	2201.57	2180.02	2134.12	2059.20	1982.45	1930.44	1867.78	1807.85	1704.53	1476.07	1305.50	1066.45	785.819	449.919	146.128	19.018	3.161	1.131	0.114	0	0
-3	2187.60	2184.20	2180.82	2151.60	2092.51	2009.94	1964.96	1909.33	1842.63	1791.01	1681.49	1450.80	1286.00	1049.46	769.634	437.37	143.239	18.893	3.145	1.13	0.113	0	0
-5	2137.70	2138.46	2117.74	2092.50	2029.95	1966.97	1933.78	1877.66	1813.46	1769.26	1645.75	1418.40	1258.04	1025.13	746.503	419.393	128.833	17.974	3.016	1.129	0.112	0	0
-7	2068.95	2065.20	2037.21	1996.46	1954.90	1923.92	1891.67	1835.11	1785.88	1729.17	1588.16	1383.75	1220.68	993.352	714.828	399.18	115.048	17.07	2.9	1.129	0.109	0	0
-9	1961.59	1961.00	1945.15	1923.14	1901.34	1871.32	1834.99	1790.39	1747.31	1668.50	1511.03	1352.43	1178.45	953.969	679.796	366.567	100.738	15.891	2.76	1.128	0.107	0	0
-11	1905.24	1906.18	1896.04	1873.34	1842.03	1811.25	1779.76	1741.45	1682.28	1591.18	1432.88	1297.92	1126.97	907.561	634.317	332.253	86.671	14.432	2.487	1.129	0.104	0	0
-13	1850.66	1847.61	1828.46	1803.02	1770.90	1746.74	1717.10	1666.87	1596.1	1492.04	1369.66	1233.66	1065.14	854.64	577.025	293.07	75.138	12.685	2.155	1.123	0.102	0	0
-15	1780.43	1774.30	1750.97	1726.80	1702.74	1672.69	1635.90	1575.72	1494.73	1401.24	1307.73	1163.35	995.502	784.402	521.655	250.929	61.18	10.673	1.864	1.116	0.099	0	0
-17	1703.09	1697.62	1675.54	1651.26	1625.06	1585.54	1532.74	1464.98	1393.88	1329.29	1227.81	1081.94	920.241	711.279	462.193	209.219	43.765	8.808	1.71	1.101	0.089	0	0
-19.5	1554.45	1555.61	1541.62	1517.03	1482.96	1441.49	1396.44	1350.28	1287.53	1217.21	1112.08	971.135	815.541	610.139	378.968	163.81	25.632	7.421	1.617	1.073	0.078	0	0
-22.5	1380.40	1380.84	1373.27	1362.24	1330.29	1290.30	1245.30	1192.62	1128.69	1056.27	958.589	823.857	671.607	489.552	274.743	97.96	19.284	6.182	1.485	0.993	0.06	0	0
-25.5	1184.26	1185.59	1177.37	1160.64	1133.52	1100.10	1058.39	1009.63	952.261	884.545	789.732	658.872	516.377	350.424	183.073	58.995	13.325	5.369	1.339	0.927	0.037	0	0
-29	940.307	942.133	935.407	920.521	896.306	865.803	827.149	782.958	722.681	657.853	571.747	461.957	335.502	210.521	91.262	23.501	7.8	3.728	1.213	0.812	0.032	0	0
-33	634.592	636.175	630.057	617.16	597.143	576.24	544.298	496.863	449.145	396.945	325.518	236.834	160.949	86.14	33.098	12.319	5.4	2.41	1.124	0.705	0.031	0	0
-37.5	307.501	309.038	305.355	296.329	284.732	261.224	236.393	210.322	182.495	151.505	113.104	76.834	46.998	21.492	11.839	5.657	3.131	1.471	1.097	0.598	0.024	0	0
-42.5	66.112	66.816	68.223	62.964	58.05	51.401	43.671	37.514	29.927	23.237	18.998	15.326	10.44	6.726	4.758	3.01	1.538	1.189	1.147	0.462	0.021	0	0
-47.5	9.078	9.249	9.59	9.316	8.962	8.425	7.724	7.105	6.555	6.118	5.763	4.99	3.704	3.039	1.985	1.435	1.199	1.118	0.938	0.125	0.015	0	0
-55	1.568	1.568	1.568	1.547	1.525	1.497	1.471	1.452	1.432	1.412	1.378	1.333	1.282	1.22	1.171	1.152	1.227	0.93	0.572	0.046	0.01	0	0
-65	0.696	0.7	0.707	0.706	0.706	0.705	0.703	0.698	0.704	0.71	0.711	0.683	0.667	0.669	0.556	0.462	0.264	0.115	0.033	0.014	0	0	0
-75	0.042	0.041	0.039	0.038	0.036	0.035	0.033	0.032	0.031	0.031	0.031	0.031	0.031	0.023	0.021	0.021	0.01	0.01	0.007	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	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	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	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	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	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	0	0
47.5	0.2	0.4	0.4	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	0	0
42.5	0.59 *	1.17 *	1.13 *	1.07 *	0.99 *	0.90 *	0.81 *	0.71 *	0.6	0.6	0.5	0.3	0.2	0.1	0.1	0	0	0	0	0	0	0	0	0
37.5	1.02 *	2.01 *	1.95 *	1.88 *	1.79 *	1.68 *	1.55 *	1.41 *	1.26 *	1.35 *	1.28 *	0.89 *	0.6	0.3	0.1	0.1	0	0	0	0	0	0	0	0
33	1.29 *	2.55 *	2.49 *	2.42 *	2.32 *	2.21 *	2.08 *	1.93 *	1.77 *	1.96 *	1.96 *	1.51 *	1.20 *	0.7	0.3	0.1	0	0	0	0	0	0	0	0
29	1.41 *	2.79 *	2.74 *	2.67 *	2.58 *	2.47 *	2.34 *	2.20 *	2.03 *	2.29 *	2.35 *	1.90 *	1.63 *	1.13 *	0.5	0.2	0	0	0	0	0	0	0	0
25.5	1.42 *	2.82 *	2.77 *	2.70 *	2.60 *	2.49 *	2.37 *	2.23 *	2.08 *	2.36 *	2.46 *	2.03 *	1.82 *	1.35 *	0.73 *	0.2	0	0	0	0	0	0	0	0
22.5	1.59 *	3.15 *	3.11 *	3.04 *	2.95 *	2.84 *	2.70 *	2.54 *	2.37 *	2.70 *	2.84 *	2.38 *	2.18 *	1.70 *	1.01 *	0.4	0.1	0	0	0	0	0	0	0
19.5	1.40 *	2.78 *	2.75 *	2.72 *	2.68 *	2.60 *	2.49 *	2.35 *	2.18 *	2.49 *	2.63 *	2.22 *	2.07 *	1.66 *	1.04 *	0.4	0.1	0	0	0	0	0	0	0
17	1.16 *	2.30 *	2.28 *	2.25 *	2.22 *	2.18 *	2.12 *	2.02 *	1.89 *	2.14 *	2.26 *	1.92 *	1.80 *	1.47 *	0.96 *	0.4	0.1	0	0	0	0	0	0	0
15	1.19 *	2.36 *	2.34 *	2.31 *	2.28 *	2.24 *	2.18 *	2.10 *	1.99 *	2.26 *	2.38 *	2.04 *	1.92 *	1.59 *	1.05 *	0.5	0.1	0	0	0	0	0	0	0
13	1.23 *	2.43 *	2.40 *	2.37 *	2.33 *	2.29 *	2.23 *	2.15 *	2.06 *	2.37 *	2.50 *	2.13 *	2.02 *	1.69 *	1.14 *	0.52 *	0.1	0	0	0	0	0	0	0
11	1.27 *	2.52 *	2.47 *	2.43 *	2.38 *	2.33 *	2.26 *	2.19 *	2.10 *	2.46 *	2.60 *	2.21 *	2.10 *	1.77 *	1.22 *	0.57 *	0.1	0	0	0	0	0	0	0
9	1.31 *	2.60 *	2.56 *	2.50 *	2.42 *	2.35 *	2.28 *	2.21 *	2.13 *	2.51 *	2.67 *	2.27 *	2.17 *	1.84 *	1.28 *	0.61 *	0.1	0	0	0	0	0	0	0
7	1.34 *	2.66 *	2.63 *	2.57 *	2.47 *	2.38 *	2.30 *	2.23 *	2.14 *	2.54 *	2.72 *	2.32 *	2.22 *	1.88 *	1.33 *	0.64 *	0.2	0	0	0	0	0	0	0
5	1.34 *	2.68 *	2.65 *	2.60 *	2.51 *	2.40 *	2.31 *	2.24 *	2.15 *	2.55 *	2.75 *	2.35 *	2.25 *	1.92 *	1.35 *	0.67 *	0.2	0	0	0	0	0	0	0
3	1.34 *	2.68 *	2.66 *	2.62 *	2.53 *	2.42 *	2.32 *	2.25 *	2.16 *	2.56 *	2.77 *	2.37 *	2.27 *	1.93 *	1.37 *	0.68 *	0.2	0	0	0	0	0	0	0
1	0.67 *	1.34 *	1.33 *	1.31 *	1.27 *	1.21 *	1.16 *	1.12 *	1.08 *	1.28 *	1.38 *	1.18 *	1.13 *	0.97 *	0.69 *	0.34 *	0.1	0	0	0	0	0	0	0
0																								



-1	0.67 *	1.34 *	1.33 *	1.31 *	1.26 *	1.21 *	1.16 *	1.12 *	1.08 *	1.28 *	1.38 *	1.18 *	1.13 *	0.96 *	0.68 *	0.34 *	0.1	0	0	0	0	0	
-3	1.34 *	2.67 *	2.65 *	2.59 *	2.49 *	2.39 *	2.31 *	2.23 *	2.15 *	2.54 *	2.73 *	2.33 *	2.24 *	1.91 *	1.35 *	0.66 *	0.2	0	0	0	0	0	
-5	1.32 *	2.63 *	2.60 *	2.53 *	2.44 *	2.35 *	2.28 *	2.20 *	2.12 *	2.51 *	2.68 *	2.29 *	2.20 *	1.87 *	1.31 *	0.63 *	0.2	0	0	0	0	0	
-7	1.28 *	2.56 *	2.52 *	2.46 *	2.38 *	2.31 *	2.25 *	2.17 *	2.09 *	2.46 *	2.62 *	2.23 *	2.14 *	1.81 *	1.26 *	0.60 *	0.1	0	0	0	0	0	
-9	1.23 *	2.46 *	2.43 *	2.38 *	2.33 *	2.27 *	2.21 *	2.13 *	2.05 *	2.38 *	2.53 *	2.17 *	2.07 *	1.74 *	1.20 *	0.55 *	0.1	0	0	0	0	0	
-11	1.18 *	2.36 *	2.35 *	2.32 *	2.27 *	2.22 *	2.16 *	2.08 *	1.99 *	2.28 *	2.43 *	2.09 *	1.98 *	1.66 *	1.12 *	0.50 *	0.1	0	0	0	0	0	
-13	1.15 *	2.30 *	2.28 *	2.25 *	2.20 *	2.16 *	2.09 *	2.01 *	1.90 *	2.17 *	2.31 *	1.99 *	1.88 *	1.55 *	1.02 *	0.4	0.1	0	0	0	0	0	
-15	1.11 *	2.22 *	2.20 *	2.17 *	2.13 *	2.08 *	2.01 *	1.91 *	1.79 *	2.05 *	2.19 *	1.87 *	1.76 *	1.43 *	0.91 *	0.4	0.1	0	0	0	0	0	
-17	1.06 *	2.13 *	2.11 *	2.09 *	2.04 *	1.98 *	1.90 *	1.79 *	1.68 *	1.93 *	2.06 *	1.75 *	1.62 *	1.29 *	0.80 *	0.3	0.1	0	0	0	0	0	
-20	1.24 *	2.49 *	2.48 *	2.44 *	2.37 *	2.29 *	2.18 *	2.07 *	1.94 *	2.24 *	2.36 *	1.99 *	1.81 *	1.41 *	0.84 *	0.3	0.1	0	0	0	0	0	
-23	1.34 *	2.69 *	2.68 *	2.64 *	2.56 *	2.46 *	2.35 *	2.23 *	2.09 *	2.38 *	2.49 *	2.06 *	1.84 *	1.38 *	0.75 *	0.3	0	0	0	0	0	0	
-26	1.17 *	2.35 *	2.34 *	2.30 *	2.24 *	2.15 *	2.05 *	1.93 *	1.79 *	2.02 *	2.08 *	1.68 *	1.45 *	1.02 *	0.5	0.2	0	0	0	0	0	0	
-29	1.14 *	2.27 *	2.26 *	2.22 *	2.16 *	2.06 *	1.95 *	1.82 *	1.67 *	1.86 *	1.87 *	1.46 *	1.19 *	0.8	0.3	0.1	0	0	0	0	0	0	
-33	0.96 *	1.93 *	1.91 *	1.88 *	1.82 *	1.73 *	1.62 *	1.48 *	1.33 *	1.44 *	1.40 *	1.02 *	0.8	0.4	0.2	0.1	0	0	0	0	0	0	
-38	0.65 *	1.30 *	1.29 *	1.26 *	1.22 *	1.14 *	1.04 *	0.93 *	0.81 *	0.84 *	0.8	0.5	0.3	0.2	0.1	0	0	0	0	0	0	0	
-43	0.3	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0	0	0	0	0	0	0	0	
-48	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	0	0	0	0	0	0	0	0	
-55	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	
-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	37	74	73	71	69	67	64	61	57	65	68	57	52	42	27	12	2.6	0.7	0.2	0	0	0	899.2

5.0 THD and PF Test

Model No.	HBLED13	Sample ID.	G1
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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° C ± 1° 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	276.93	60	0.060	15.60	0.933	11.04%
25.1	119.98	60	0.122	14.50	0.992	8.29%

6.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration	Calibration Due Date
DLF107	Integrating Sphere System	2017/12/28	2018/12/27
DLF108	Auxiliary Lamp	2017/12/28	2018/12/27
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-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*****