

Photometric Test Report

Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77:2017

Prepared For

RAB Lighting Inc.

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

Xiao Xiang, 15921313292, Gary.Xiao@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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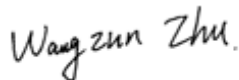
Test Date

2023/1/11

Issue Date

2023/1/16

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 v5.1

Outdoor - Pole/Arm-Mounted Area and Roadway Luminaires				
Requirement Category	Test Method	Requirements		Test value
Luminaire Output (lm) (Goniophotometer - Section 4.2)	IES LM-79-2008	1000		12666
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	138.4
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		91.5
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	5.26%
		20.00%	277V	11.71%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.998
		0.9	277V	0.902
Allowable CCTs* (K) (Integrating Sphere - Section 4.1)	IES LM-79-2008	7 step	3045±175	2942
		4 step	3045±100	
Minimum CRI (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥70		82
Minimum R9 (Integrating Sphere - Section 4.1)	IES LM-79-2008 CIE 13.3-1995	≥-40		3
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		83
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥89		98
Minimum IES Rcs,h1 (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	-18%≤IES Rcs,h1≤+23%		-12%
Zonal Lumen Requirement (0°-90°) (Goniophotometer - Section 4.2)	IES LM-79-2008	100%		100.00%
Zonal Lumen Requirement (80°-90°) (Goniophotometer - Section 4.2)	IES LM-79-2008	≤10%		2.65%
Input Voltage (V)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		120
(Goniophotometer - Section 4.2)		Non-Worst Case		277
Input Current (A)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		0.764
(Goniophotometer - Section 4.2)		Non-Worst Case		0.360
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		91.5
(Goniophotometer - Section 4.2)		Non-Worst Case		90.0

2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023/1/11	ALEDM4TY	H1
2	Goniophotometer Test	2023/1/11	ALEDM4TY	H1
3	THD and PF Test	2023/1/11	ALEDM4TY	H1

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.

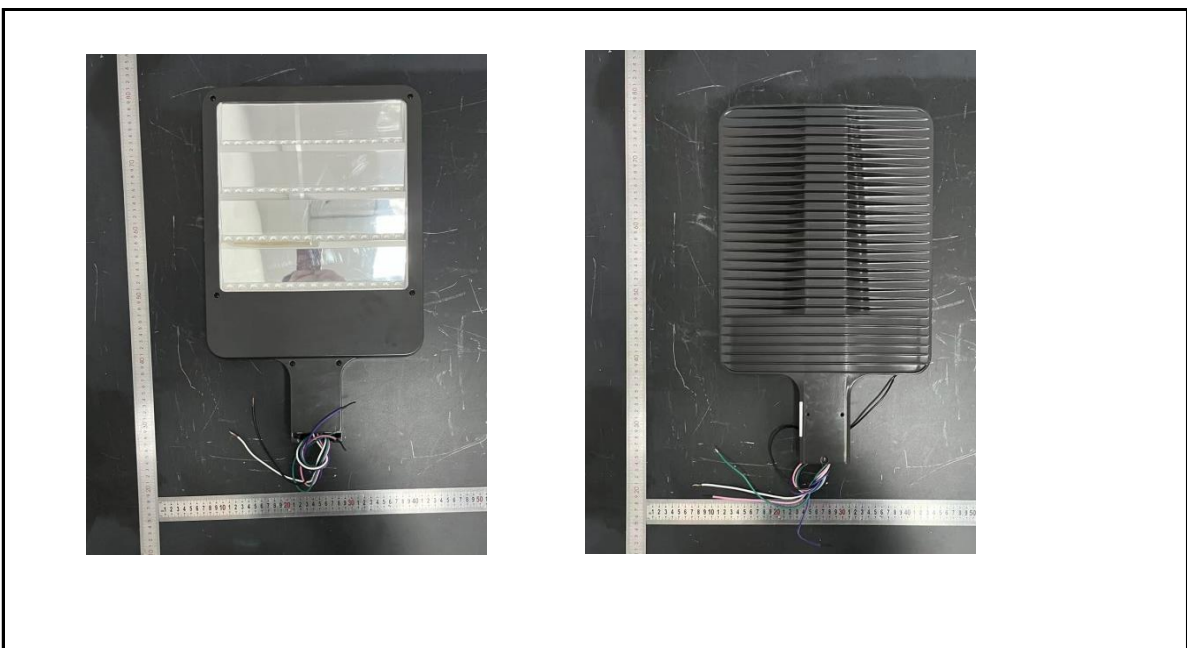
3.0 Production Description

Luminaire Description: ALEDM4TY

Description: 90W @ 3000K

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

Photos of Luminaire Characteristics



4.0 LM-79 Measurement and Test Results

4.1 Integrating Sphere Test

Model No.	ALEDM4TY	Sample ID.	H1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	56.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric paramters 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 Result

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
120.00	60	0.764	91.5	0.998
277.00	60	0.360	90.0	0.902

Test Result

CCT (K)	CRI	R9	Duv
2942	82	3	0.0021

Rf	Rg	IES Rcs,h1
83	98	-12%

4.0 LM-79 Measurement and Test Results

4.2 Goniophotometer Test

Model No.	ALEDM4TY	Sample ID.	H1
Opreate time (Min.)	90	Stabilization time (Min.)	45
Temperature (°C)	25.3	Humidity (%RH)	54.0

Test Method

The samples were tested according to the IES LM-79-2008.

Photometric paramters 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

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.00	60	0.764	91.5	0.998
NON-WROST CASE	277.00	60	0.360	90.0	0.902

Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
12666	96.5	148.6	48.7	134.4	138.4

Zonal Lumen Requirement (0° - 90°)	Zonal Lumen Requirement (80° - 90°)	BUG rating
100.00%	2.65%	B1-U0-G3

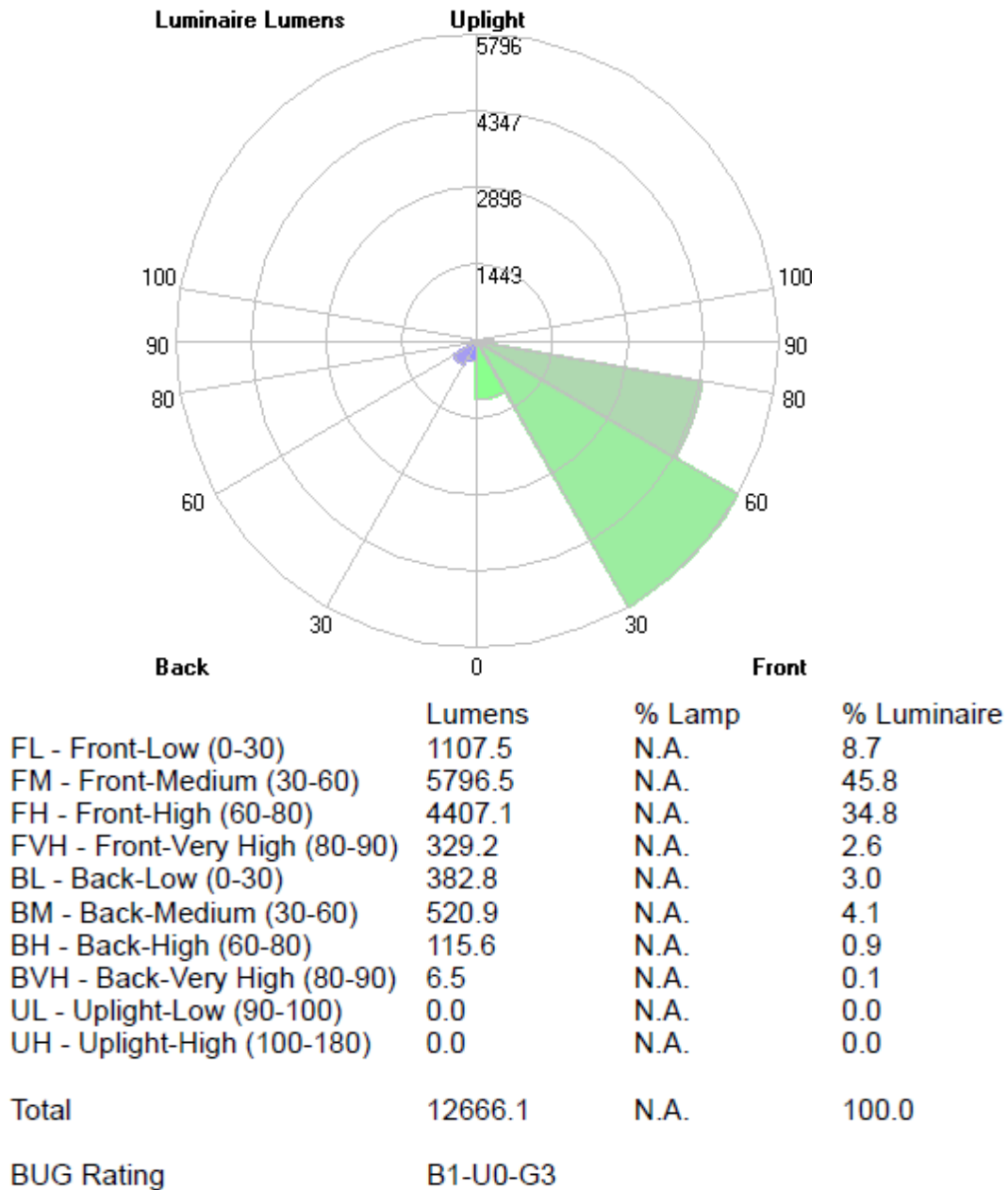
4.2 Goniophotometer Test

Zonal Lumen Summary

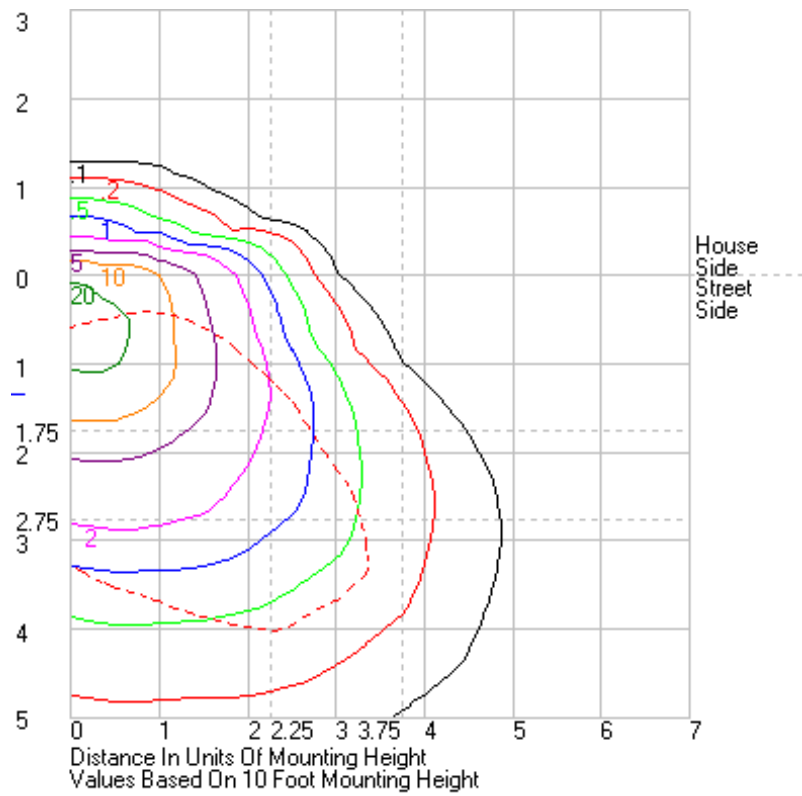
	Zonal (lm)		Total (lm)	Percent
0-10	176.34	0 - 10	176.34	1.39%
10-20	471.96	0 - 20	648.30	5.12%
20-30	842.04	0 - 30	1490.34	11.77%
30-40	1437.15	0 - 40	2927.49	23.11%
40-50	2133.4	0 - 50	5060.89	39.96%
50-60	2746.81	0 - 60	7807.70	61.64%
60-70	2726.2	0 - 70	10533.90	83.17%
70-80	1796.44	0 - 80	12330.34	97.35%
80-90	335.72	0 - 90	12666.06	100.00%
90-100	0.00	0 - 100	12666.06	100.00%
100-110	0.00	0 - 110	12666.06	100.00%
110-120	0.00	0 - 120	12666.06	100.00%
120-130	0.00	0 - 130	12666.06	100.00%
130-140	0.00	0 - 140	12666.06	100.00%
140-150	0.00	0 - 150	12666.06	100.00%
150-160	0.00	0 - 160	12666.06	100.00%
160-170	0.00	0 - 170	12666.06	100.00%
170-180	0.00	0 - 180	12666.06	100.00%

4.2 Goniophotometer Test

LCS/BUG



Isolines



4.2 Goniophotometer Test

	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360
0	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29	1938.29
1	1975.31	1974.64	1971.09	1966.27	1958.13	1948.52	1937.12	1924.9	1913.63	1903.54	1895.03	1889.54	1889.53	1889.54	1895.03	1903.54	1913.63	1924.9	1937.12	1948.52	1958.13	1966.27	1971.09	1974.64	1975.31
2	2009.65	2007.16	2001.9	1993.26	1979.5	1962.25	1941.18	1917.5	1893.07	1869.76	1848.7	1835.5	1827.05	1835.5	1848.7	1869.76	1893.07	1917.5	1941.18	1962.25	1979.5	1993.26	2001.9	2007.16	2009.65
3	2036.97	2036.21	2030.22	2021.08	2004.82	1979.58	1946.81	1908.18	1866.48	1823.59	1787.37	1761.59	1754.18	1761.59	1787.37	1823.59	1866.48	1908.18	1946.81	1979.58	2004.82	2021.08	2030.22	2036.21	2036.97
4	2060.11	2059.37	2056.24	2047.53	2028.09	1996.73	1953.28	1900.07	1839.04	1774.57	1717.78	1679.29	1661.77	1679.29	1717.78	1774.57	1839.04	1900.07	1953.28	1996.73	2028.09	2047.53	2056.24	2059.37	2060.11
5	2078.1	2078.86	2079.72	2073.89	2052.71	2014.78	1959.28	1889.56	1806.1	1717.01	1637.14	1582.97	1560.38	1582.97	1637.14	1717.01	1806.1	1889.56	1959.28	2014.78	2052.71	2073.89	2079.72	2078.86	2078.1
6	2091.68	2095.48	2101.97	2100.62	2078.38	2032.03	1963.6	1874.52	1764.23	1647.19	1544.11	1474.04	1451.68	1474.04	1544.11	1647.19	1764.23	1874.52	1963.6	2032.03	2078.38	2100.62	2101.97	2095.48	2091.68
7	2103.4	2109.12	2122.59	2125.93	2101.1	2047.31	1965.97	1858.75	1723.12	1576.61	1450.03	1365.61	1329.52	1365.61	1450.03	1576.61	1723.12	1858.75	1965.97	2047.31	2101.1	2125.93	2122.59	2109.12	2103.4
8	2117.14	2125.26	2142.65	2150.68	2124.35	2061.66	1966.32	1838.26	1672.16	1494.42	1345.45	1249.03	1217.6	1249.03	1345.45	1494.42	1672.16	1838.26	1966.32	2061.66	2124.35	2150.68	2142.65	2125.26	2117.14
9	2136.13	2147.12	2166	2172.53	2142.84	2071.72	1963.46	1814.91	1617.98	1412.46	1241.55	1133.2	1096.62	1133.2	1241.55	1412.46	1617.98	1814.91	1963.46	2071.72	2142.84	2172.53	2166	2147.12	2136.13
10	2160.64	2173.91	2194.26	2193.22	2158.78	2079.19	1957.94	1789.01	1562.42	1328.18	1140.56	1023.22	981.617	1023.22	1140.56	1328.18	1562.42	1789.01	1957.94	2079.19	2158.78	2193.22	2194.26	2173.91	2160.64
11	2193.51	2210.2	2228.33	2215.03	2172.02	2084.27	1950.45	1758.65	1498.19	1236.9	1033.86	914.227	875.448	914.227	1033.86	1236.9	1498.19	1758.65	1950.45	2084.27	2172.02	2215.03	2228.33	2210.2	2193.51
12	2240.6	2256.3	2267.49	2237.25	2180	2085.79	1942.19	1730.25	1438.28	1154.21	937.618	811.47	769.377	811.47	937.618	1154.21	1438.28	1730.25	1942.19	2085.79	2180	2237.25	2267.49	2256.3	2240.6
13	2292.16	2313.96	2316.35	2262.93	2186.99	2088.53	1933.86	1698.28	1372.47	1063.94	843.735	711.289	670.912	711.289	843.735	1063.94	1372.47	1698.28	1933.86	2088.53	2186.99	2262.93	2316.35	2313.96	2292.16
14	2347.08	2375.19	2374.76	2289.72	2192.33	2089.11	1924.8	1665.48	1305.7	978.245	751.45	615.875	577.161	615.875	751.45	978.245	1305.7	1665.48	1924.8	2089.11	2192.33	2289.72	2374.76	2375.19	2347.08
15	2412.68	2439.71	2435.01	2318.31	2198.46	2089.65	1916.75	1634.75	1242.95	901.382	667.329	534.371	493.829	534.371	667.329	901.382	1242.95	1634.75	1916.75	2089.65	2198.46	2318.31	2435.01	2439.71	2412.68
16	2486.44	2519.53	2502.06	2356.42	2207.5	2093.81	1911.46	1600.85	1172.51	820.332	581.664	458.698	428.063	458.698	581.664	820.332	1172.51	1600.85	1911.46	2093.81	2207.5	2356.42	2502.06	2519.53	2486.44
17	2567.09	2604	2570.19	2394.89	2216.9	2099.22	1908.06	1572.31	1110.89	747.15	511.349	408.414	378.029	408.414	511.349	747.15	1110.89	1572.31	1908.06	2099.22	2216.9	2394.89	2570.19	2604	2567.09
18	2654.95	2693.98	2648.12	2440.7	2231.74	2107.84	1908.36	1543.93	1047.72	674.554	447.654	365.414	342.655	365.414	447.654	674.554	1047.72	1543.93	1908.36	2107.84	2231.74	2440.7	2648.12	2693.98	2654.95
19	2743.32	2790.97	2731.8	2490.53	2252.5	2120.33	1915.23	1516.46	985.502	606.159	402.695	333.149	320.231	333.149	402.695	606.159	985.502	1516.46	1915.23	2120.33	2252.5	2490.53	2731.8	2790.97	2743.32
20	2844.84	2889.45	2817.67	2539.94	2276.25	2139.09	1928.37	1496.1	931.063	547.506	364.381	312.013	301.212	312.013	364.381	547.506	931.063	1496.1	1928.37	2139.09	2276.25	2539.94	2817.67	2889.45	2844.84
21	2949.99	2998.65	2912.12	2599.28	2308.06	2165.92	1947.91	1474	875.283	488.991	336.344	295.651	288.571	295.651	336.344	488.991	875.283	1474	1947.91	2165.92	2308.06	2599.28	2912.12	2998.65	2949.99
22	3055.64	3109.48	3011.2	2663.17	2343.61	2199.81	1974.86	1459	828.431	443.755	316.26	283.088	276.297	283.088	316.26	443.755	828.431	1459	1974.86	2199.81	2343.61	2663.17	3011.2	3109.48	3055.64
23	3171.87	3226.72	3115.8	2736.9	2388.21	2243.42	2012.07	1445.99	780.862	404.529	299.805	271.965	265.792	271.965	299.805	404.529	780.862	1445.99	2012.07	2243.42	2388.21	2736.9	3115.8	3226.72	3171.87
24	3288.64	3350.83	3229.58	2822.42	2442.84	2292.92	2053.63	1432.4	733.932	371.488	286.822	261.479	255.859	261.479	286.822	371.488	733.932	1432.4	2053.63	2292.92	2442.84	2822.42	3229.58	3350.83	3288.64
25	3407.63	3473.17	3343.63	2906.92	2503.85	2351.03	2102.7	1425.04	691.009	347.079	276.336	251.756	244.525	251.756	276.336	347.079	691.009	1425.04	2102.7	2351.03	2503.85	2906.92	3343.63	3473.17	3407.63
26	3527.83	3602.2	3468.82	3004.41	2580.04	2417.94	2156.76	1415.17	646.003	325.332	266.318	242.073	234.565	242.073	266.318	325.332	646.003	1415.17	2156.76	2417.94	2580.04	3004.41	3468.82	3602.2	3527.83
27	3638.43	3726.36	3595.11	3107.39	2659.4	2490.64	2214.02	1407.45	602.78	309.121	257.322	233.343	226.433	233.343	257.322	309.121	602.78	1407.45	2214.02	2490.64	2659.4	3107.39	3595.11	3726.36	3638.43
28	3754.14	3851.07	3720.38	3216.24	2749.66	2567.46	2275.73	1400.79	561.633	295.815	248.43	225.73	218.354	225.73	248.43	295.815	561.633	1400.79	2275.73	2567.46	2749.66	3216.24	3720.38	3851.07	3754.14
29	3859.07	3973.32	3850.69	3340.14	2846.47	2648.41	2340.09	1389.55	519.783	284.396	239.805	217.914	210.978	217.914	239.805	284.396	519.783	1389.55	2340.09	2648.41	2846.47	3340.14	3850.69	3973.32	3859.07
30	3965.74	4091.83	3973.32	3462.49	2943.68	2731.74	2406.39	1380.73	484.185	275.403	232.403	210.63	203.464	210.63	232.403	275.403	484.185	1380.73	2406.39	2731.74	2943.68	3462.49	3973.32	4091.83	3965.74
31	4077.76	4209.43	4100.19	3590.37	3049.45	2815.86	2474.72	1367.5	449.541	266.699	225.125	203.142	195.786	203.142	225.125	266.699	449.541	1367.5	2474.72	2815.86	3049.45	3590.37	4100.19	4209.43	4077.76
32	4186.29	4329.98	4222	3721.97	3155.37	2902.84	2541.26	1352.32	415.829	258.429	218.058	195.648	188.574	195.648	218.058	258.429	415.829	1352.32	2541.26	2902.84	3155.37	3721.97	4222	4329.98	4186.29
33	4308.19	4456.07	4339.58	3849.5	3262.83	2988.86	2606.23	1337.28	389.218	250.705	211.129	188.62	181.047	188.62	211.129	250.705	389.218	1337.28	2606.23	2988.86	3262.83	3849.5	4339.58	4456.07	4308.19
34	4424.43	4587.45	4462.15	3982.64	3375.62	3071.48	2666.08	1312.75	364.171	242.704	203.872	181.251	173.605	181.251	203.872	242.704	364.171	1312.75	2666.08	3071.48	3375.62	3982.64	4462.15	4587.45	4424.43
35	4536.01	4720.96	4583.7	4111.71	3484.17	3151.77	2721.15	1288.92	341.774	235.821	197.074	173.934	166.367	173.934	197.074	235.821	341.774	1288.92	2721.15	3151.77	3484.17	4111.71	4583.7	4720.96	4536.01
36	4659.79	4855.63	4715.84	4237.99	3597.33	3227.36	2768.16	1258.65	322.4	228.872	189.994	166.584	158.373	166.584	189.994	228.872	322.4	1258.65	2768.16	3227.36	3597.33	4237.99	4715.84	4855.63	4659.79
37	4775.44	4996.87	4854.13	4367.92	3706.85	3292.56	2806	1220.25	304.973	221.865	182.947	158.847	151.109	158.847	182.947	221.865	304.973	1220.25	2806	3292.56	3706.85	4367.92	4854.13	4996.87	4775.44
38	4894.45	5135.38	4991.61	4486.77	3810.04	3349.53	2835.18	1181.51	290.346	215.337	175.965	151.26	142.721	151.26	175.965	215.337	290.								

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161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
163	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
166	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
167	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
171	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
172	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
176	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
177	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
179	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4.0 LM-79 Measurement and Test Results

4.3 THD and PF Test

Model No.	ALEDM4TY	Sample ID.	H1
Temperature (°C)	25.3	Humidity (%RH)	56.0

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

Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor	THD
120.00	60	0.764	91.5	0.998	5.26%
277.00	60	0.360	90.0	0.902	11.71%

5.0 Equipment Information

Test Equipment			
Equipment ID	Equipment Name	Last Calibration Date	Calibration Due Date
DLF107	Integrating Sphere System	2022/12/26	2023/12/25
DLF108	Auxiliary Lamp	2022/12/26	2023/12/25
DLF122	Measurement Standard Lamp Standard Lamp Type: 220 V, 0.4720 A, Tungsten, Omni-derectional	2022/12/26	2023/12/25
DLF116	AC Power Source	2022/12/26	2023/12/25
DLF113	Power Meter	2022/12/26	2023/12/25
DLF112	Temperature Recorder	2022/12/26	2023/12/25
DLF114	Temperature & Humidity Datalogger	2022/12/26	2023/12/25
DLF101	Goniophotometer	2022/12/26	2023/12/25
DLF125	Standard Lamp Standard Lamp Type: 76.58 V, 6.7875 A, Tungsten, Omni-derectional	2022/12/26	2023/12/25
DLF104	AC Power Source	2022/12/26	2023/12/25
DLF507	DC Power Source	2022/12/26	2023/12/25
DLF102	Power Meter	2022/12/26	2023/12/25
DLF111	Temperature & Humidity Datalogger	2022/12/26	2023/12/25
DLF119	Power Meter	2022/12/26	2023/12/25
DLF031	Temperature data logger	2022/12/26	2023/12/25
DLF022	Digital power meter	2022/12/26	2023/12/25
DLF003	Temperature & Humidity Datalogger	2022/12/26	2023/12/25

***** End of Test Report*****