

# Photometric Test Report

## Relevant Standards

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

## Prepared For

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## Project Number

**DLF2301106**

## Report Number

**DLF2301106-46aMOD90W**

## Test Date

**2023/2/6**

## Issue Date

**2023/2/7**

## Prepared By



Wangzun Zhu

## Approved By



Kevin Jia

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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		12835
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	141.0
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		91.0
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	2933
		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		4
Minimum Rf (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥70		84
Minimum Rg (Integrating Sphere - Section 4.1)	ANSI/IES TM-30-18	≥89		94
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%		1.09%
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		0.760
(Goniophotometer - Section 4.2)		Non-Worst Case		0.357
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		91.0
(Goniophotometer - Section 4.2)		Non-Worst Case		89.2

## 2.0 Test List

Test Item	Test	Test Date	Model Number	Sample No.
1	Integrating Sphere Test	2023/2/6	ALEDM3TY	AT1
2	Goniophotometer Test	2023/2/6	ALEDM3TY	AT1
3	THD and PF Test	2023/2/6	ALEDM3TY	AT1

### 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.

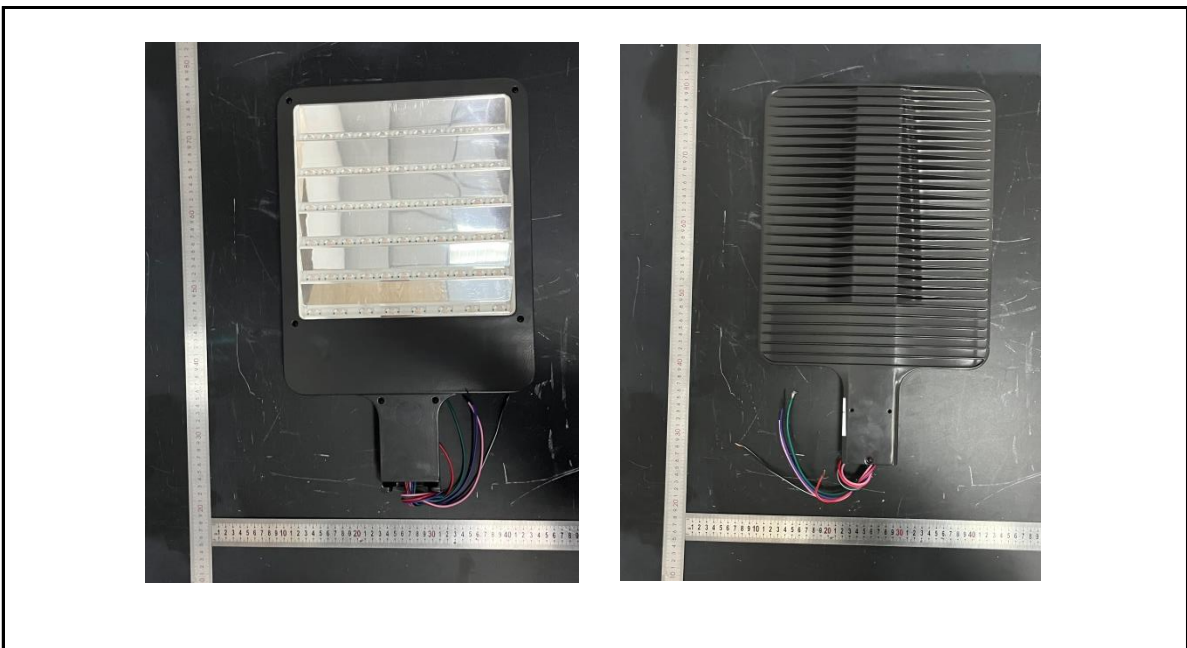
## 3.0 Production Description

**Luminaire Description:** ALEDM3TY

**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.	ALEDM3TY	Sample ID.	AT1
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  $\pm 0.2$  percent under load.

The sample was measured using  $4\pi$  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	0.760	91.0	0.998
277.00	60	0.357	89.2	0.902

#### Test Result

CCT (K)	CRI	R9	Duv
2933	82	4	0.0012

Rf	Rg	IES Rcs,h1
84	94	-12%

## 4.0 LM-79 Measurement and Test Results

### 4.2 Goniophotometer Test

Model No.	ALEDM3TY	Sample ID.	AT1
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  $\pm 0.2$  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  $0.5^{\circ}$  vertical intervals and  $10^{\circ}$  horizontal intervals.

#### Test Conditions

Condition	Voltage (Vac)	Frequency (Hz)	Current (A)	Power (W)	Power Factor
WORST CASE	120.00	60	0.760	91.0	0.998
NON-WROST CASE	277.00	60	0.357	89.2	0.902

#### Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
12835	91.2	164.2	37.0	152.5	141.0

Zonal Lumen Requirement ( $0^{\circ}$ - $90^{\circ}$ )	Zonal Lumen Requirement ( $80^{\circ}$ - $90^{\circ}$ )	BUG rating
100.00%	1.09%	B2-U0-G2

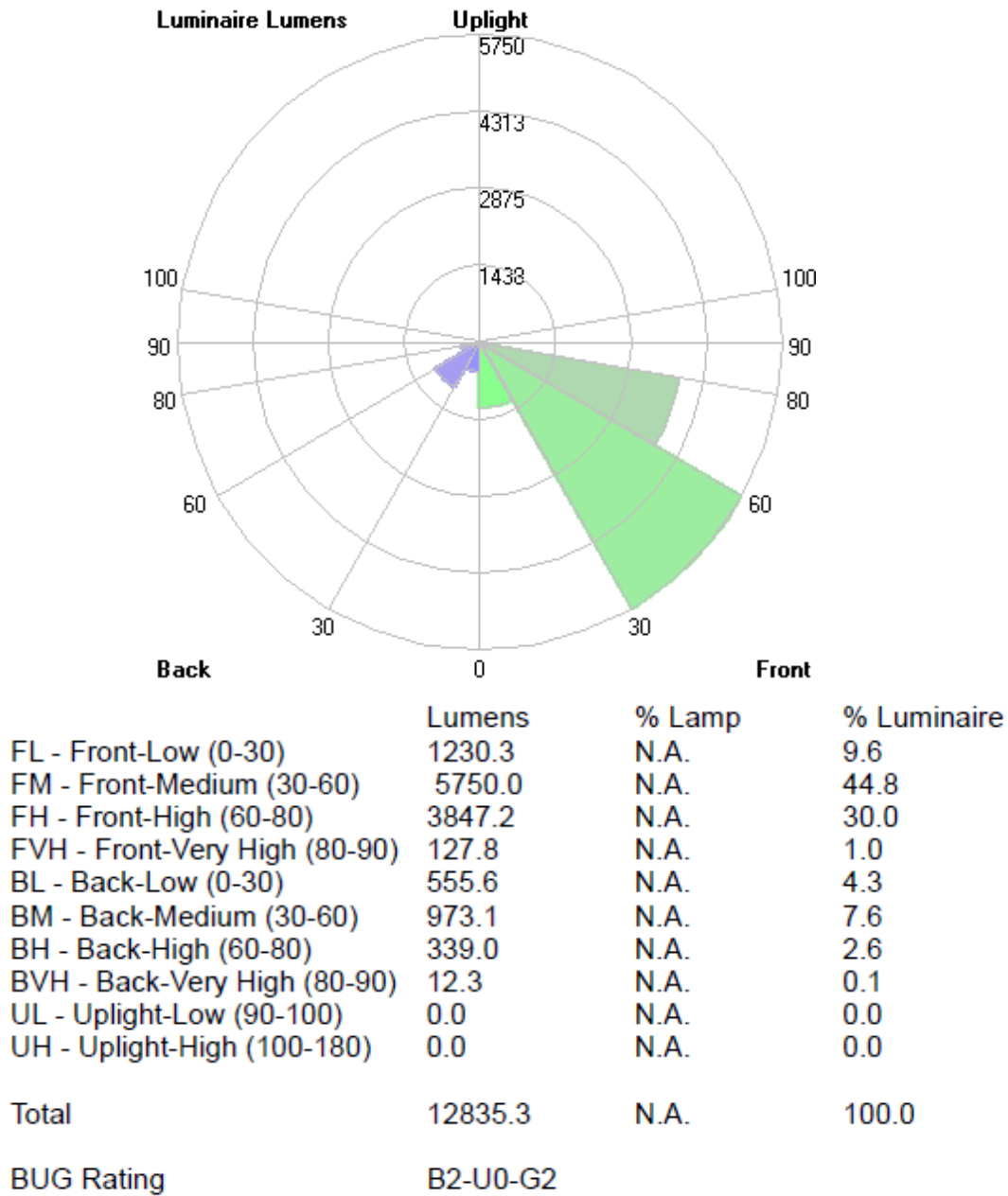
## 4.2 Goniophotometer Test

### Zonal Lumen Summary

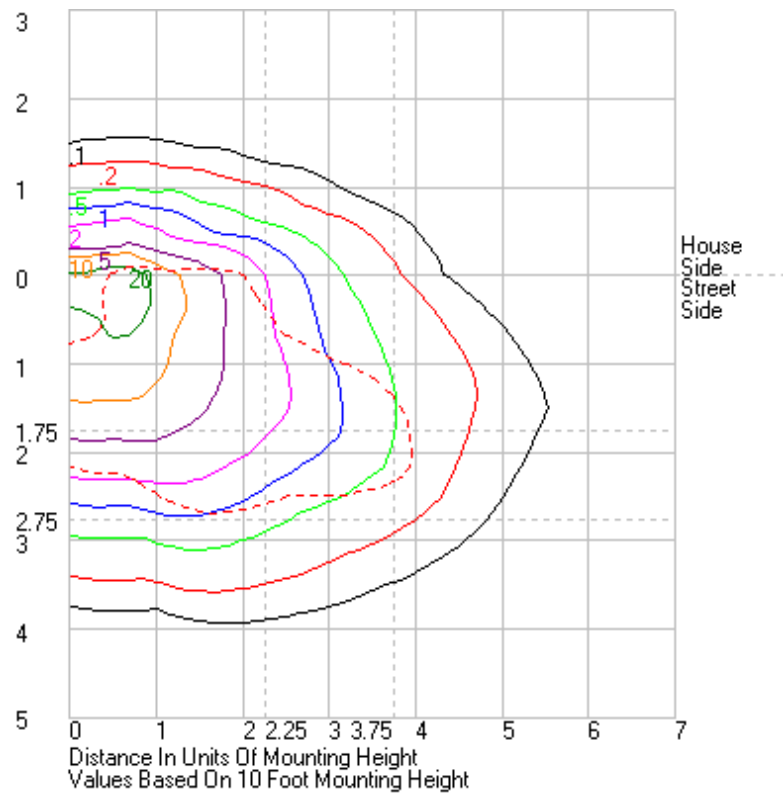
	Zonal (lm)		Total (lm)	Percent
0-10	202.62	0 - 10	202.62	1.58%
10-20	567.96	0 - 20	770.58	6.00%
20-30	1015.32	0 - 30	1785.90	13.91%
30-40	1703.39	0 - 40	3489.29	27.19%
40-50	2288.26	0 - 50	5777.55	45.01%
50-60	2731.41	0 - 60	8508.96	66.29%
60-70	2767.97	0 - 70	11276.93	87.86%
70-80	1418.29	0 - 80	12695.22	98.91%
80-90	140.09	0 - 90	12835.31	100.00%
90-100	0.00	0 - 100	12835.31	100.00%
100-110	0.00	0 - 110	12835.31	100.00%
110-120	0.00	0 - 120	12835.31	100.00%
120-130	0.00	0 - 130	12835.31	100.00%
130-140	0.00	0 - 140	12835.31	100.00%
140-150	0.00	0 - 150	12835.31	100.00%
150-160	0.00	0 - 160	12835.31	100.00%
160-170	0.00	0 - 170	12835.31	100.00%
170-180	0.00	0 - 180	12835.31	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	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42	2149.42
1	2181.08	2177.82	2174.29	2169.55	2163.59	2156.54	2148.88	2141.09	2134.01	2127.45	2121.72	2118.58	2119.91	2118.58	2121.72	2127.45	2134.01	2141.09	2148.88	2156.54	2163.59	2169.55	2174.29	2177.82	2181.08
2	2214.62	2209.77	2204.64	2195.2	2183.46	2168.7	2153.14	2138.1	2123.21	2109.97	2098.22	2089.89	2089.13	2089.89	2098.22	2109.97	2123.21	2138.1	2153.14	2168.7	2183.46	2195.2	2204.64	2209.77	2214.62
3	2255.32	2249.51	2241.36	2225.93	2208.1	2185.38	2161.52	2137.64	2113.88	2087.08	2063.15	2045.95	2041.77	2045.95	2063.15	2087.08	2113.88	2137.64	2161.52	2185.38	2208.1	2225.93	2241.36	2249.51	2255.32
4	2292.78	2287.53	2277.35	2260.15	2234.78	2203.52	2171.04	2138.11	2101.43	2060.83	2021.05	1990.34	1976.92	1990.34	2021.05	2060.83	2101.43	2138.11	2171.04	2203.52	2234.78	2260.15	2277.35	2287.53	2292.78
5	2329.5	2322.75	2314.82	2295.61	2265.05	2225.09	2182.04	2140.28	2088.45	2026.23	1959.17	1905.49	1886.88	1905.49	1959.17	2026.23	2088.45	2140.28	2182.04	2225.09	2265.05	2295.61	2314.82	2322.75	2329.5
6	2363.29	2358.27	2350.32	2333.28	2296.94	2247.24	2194.34	2142.19	2071.76	1977.61	1873.26	1798.27	1766.36	1798.27	1873.26	1977.61	2071.76	2142.19	2194.34	2247.24	2296.94	2333.28	2350.32	2358.27	2363.29
7	2393.66	2389.17	2384.74	2368.9	2331.28	2272.17	2208.21	2145.05	2051.77	1916.05	1780.31	1681.95	1640.12	1681.95	1780.31	1916.05	2051.77	2145.05	2208.21	2272.17	2331.28	2368.9	2384.74	2389.17	2393.66
8	2428.18	2424.07	2420.62	2404.98	2366.01	2298.94	2224.08	2147.42	2024.63	1842.9	1666.41	1541.21	1494.49	1541.21	1666.41	1842.9	2024.63	2147.42	2224.08	2298.94	2366.01	2404.98	2420.62	2424.07	2428.18
9	2457.67	2457.24	2455.93	2440.43	2399.8	2327.29	2242.17	2150.54	1987.03	1760.36	1546.09	1412.52	1354.48	1412.52	1546.09	1760.36	1987.03	2150.54	2242.17	2327.29	2399.8	2440.43	2455.93	2457.24	2457.67
10	2480.53	2483.41	2492.04	2476.6	2436.46	2359.46	2264.97	2155.3	1945.87	1665.93	1431.43	1272.78	1214.21	1272.78	1431.43	1665.93	1945.87	2155.3	2264.97	2359.46	2436.46	2476.6	2492.04	2483.41	2480.53
11	2497.49	2504.35	2524.46	2515.93	2473.71	2396.93	2293.77	2163.67	1897.54	1566.74	1301.37	1127.63	1058.61	1127.63	1301.37	1566.74	1897.54	2163.67	2293.77	2396.93	2473.71	2515.93	2524.46	2504.35	2497.49
12	2507.43	2518.67	2549.06	2554.27	2516.28	2441.48	2329.88	2174.94	1845.27	1470.54	1182.46	997.454	928.283	997.454	1182.46	1470.54	1845.27	2174.94	2329.88	2441.48	2516.28	2554.27	2549.06	2518.67	2507.43
13	2514.44	2528.33	2570.02	2592.38	2565.97	2495.86	2378.31	2191.86	1790.42	1367.72	1054.67	862.497	797.96	862.497	1054.67	1367.72	1790.42	2191.86	2378.31	2495.86	2565.97	2592.38	2570.02	2528.33	2514.44
14	2514.51	2535.39	2586.99	2627.57	2622.59	2564.43	2441.4	2215.52	1729.57	1264.42	937.716	741.339	677.039	741.339	937.716	1264.42	1729.57	2215.52	2441.4	2564.43	2622.59	2627.57	2586.99	2535.39	2514.51
15	2501.73	2532.31	2602.72	2663.66	2688.83	2648	2519.54	2247.75	1675.58	1161.72	824.289	639.896	589.211	639.896	824.289	1161.72	1675.58	2247.75	2519.54	2648	2688.83	2663.66	2602.72	2532.31	2501.73
16	2479.38	2517.59	2614.52	2702.07	2769.64	2747.61	2611.45	2291.58	1622.99	1058.63	713.623	556.453	514.235	556.453	713.623	1058.63	1622.99	2291.58	2611.45	2747.61	2769.64	2702.07	2614.52	2517.59	2479.38
17	2461.05	2502.85	2618.75	2741.25	2863.61	2858.65	2715.74	2339.93	1575	965.465	633.112	502.316	470.827	502.316	633.112	965.465	1575	2339.93	2715.74	2858.65	2863.61	2741.25	2618.75	2502.85	2461.05
18	2441.47	2488.4	2617.96	2789.05	2968.49	2981.53	2825.35	2393.07	1533.09	872.641	566.794	465.489	441.553	465.489	566.794	872.641	1533.09	2393.07	2825.35	2981.53	2968.49	2789.05	2617.96	2488.4	2441.47
19	2422.31	2475.25	2618.4	2842.22	3077.74	3108.07	2934.54	2443.55	1480.79	790.387	520.053	440.81	418.82	440.81	520.053	790.387	1480.79	2443.55	2934.54	3108.07	3077.74	2842.22	2618.4	2475.25	2422.31
20	2407.41	2464.68	2620.18	2898.8	3200.63	3233.89	3040.45	2491.33	1428.52	718.784	492.028	422.43	400.828	422.43	492.028	718.784	1428.52	2491.33	3040.45	3233.89	3200.63	2898.8	2620.18	2464.68	2407.41
21	2388.37	2455.85	2625.69	2961.12	3326.29	3355.2	3142.24	2526.43	1372.41	659.526	469.617	404.496	383.387	404.496	469.617	659.526	1372.41	2526.43	3142.24	3355.2	3326.29	2961.12	2625.69	2455.85	2388.37
22	2369.22	2445.68	2635.08	3028.59	3445.7	3471.84	3240.44	2555.12	1306.52	613.936	453.09	389.067	368.497	389.067	453.09	613.936	1306.52	2555.12	3240.44	3471.84	3445.7	3028.59	2635.08	2445.68	2369.22
23	2350.02	2432.18	2651.38	3107.36	3562.68	3589.55	3346.44	2576.32	1237.77	581.283	438.871	374.643	355.138	374.643	438.871	581.283	1237.77	2576.32	3346.44	3589.55	3562.68	3107.36	2651.38	2432.18	2350.02
24	2337.4	2422.25	2669.67	3189.82	3672.34	3712.52	3456.43	2597.05	1161.07	562.199	425.749	362.159	343.029	362.159	425.749	562.199	1161.07	2597.05	3456.43	3712.52	3672.34	3189.82	2669.67	2422.25	2337.4
25	2337.2	2422.84	2687.93	3276.79	3785.5	3844.74	3580.24	2617.36	1087.57	548.512	414.541	352.45	333.366	352.45	414.541	548.512	1087.57	2617.36	3580.24	3844.74	3785.5	3276.79	2687.93	2422.84	2337.2
26	2349.33	2431.98	2708.97	3363.3	3896.41	3998.26	3714.85	2640.44	1015.24	537.54	403.858	342.701	323.702	342.701	403.858	537.54	1015.24	2640.44	3714.85	3998.26	3896.41	3363.3	2708.97	2431.98	2349.33
27	2380.14	2455.86	2737.94	3448.56	4015.13	4161.06	3857.92	2663.53	946.269	528.724	396.009	334.733	314.702	334.733	396.009	528.724	946.269	2663.53	3857.92	4161.06	4015.13	3448.56	2737.94	2455.86	2380.14
28	2429.14	2498.91	2781.93	3532.75	4138.64	4335.85	4006.68	2685.82	885.927	519.783	389.731	326.844	306.517	326.844	389.731	519.783	885.927	2685.82	4006.68	4335.85	4138.64	3532.75	2781.93	2498.91	2429.14
29	2501.75	2569.64	2834.25	3604.95	4285.08	4516.8	4159.95	2703.17	830.114	512.828	384.077	319.061	298.037	319.061	384.077	512.828	830.114	2703.17	4159.95	4516.8	4285.08	3604.95	2834.25	2569.64	2501.75
30	2575.78	2655.57	2906.48	3674.22	4441.91	4707.63	4312.31	2712.07	779.54	506.701	379.659	311.79	289.971	311.79	379.659	506.701	779.54	2712.07	4312.31	4707.63	4441.91	3674.22	2906.48	2655.57	2575.78
31	2679.72	2759.78	2996.15	3737.88	4603.41	4898.29	4453.62	2711.06	744.869	500.6	375.314	303.23	281.852	303.23	375.314	500.6	744.869	2711.06	4453.62	4898.29	4603.41	3737.88	2996.15	2759.78	2679.72
32	2798.44	2883.41	3110.1	3798.86	4768.24	5080.36	4583.63	2696.13	719.086	496.814	371.264	295.237	273.667	295.237	371.264	496.814	719.086	2696.13	4583.63	5080.36	4768.24	3798.86	3110.1	2883.41	2798.44
33	2927.54	3013.69	3237.33	3871.48	4934.78	5254.56	4698.04	2658.12	706.72	493.823	367.044	287.085	266.239	287.085	367.044	493.823	706.72	2658.12	4698.04	5254.56	4934.78	3871.48	3237.33	3013.69	2927.54
34	3089.72	3164.27	3372.34	3950.76	5088.14	5411.66	4791.58	2598.96	700.291	491.982	361.929	278.302	254.445	278.302	361.929	491.982	700.291	2598.96	4791.58	5411.66	5088.14	3950.76	3372.34	3164.27	3089.72
35	3240.48	3312.98	3518.9	4046.27	5235.68	5552.89	4864.86	2518.56	696.675	492.074	357.854	268.119	240.166	268.119	357.854	492.074	696.675	2518.56	4864.86	5552.89	5235.68	4046.27	3518.9	3312.98	3240.48
36	3405.34	3479.06	3680.08	4159.33	5367.19	5671.55	4915.65	2423.16	695.906	493.533	353.62	252.657	220.931	252.657	353.62	493.533	695.906	2423.16	4915.65	5671.55	5367.19	4159.33	3680.08	3479.06	3405.34
37	3559.75	3647.95	3844.27	4287.48	5475.62	5765.95	4937.76	2313.1	695.361	495.565	348.19	233.829	198.856	233.829	348.19	495.565	695.361	2313.1	4937.76	5765.95	5475.62	4287.48	3844.27	3647.95	3559.75
38	3691.46	3796.53	4015.74	4427.16	5555.16	5833.14	4936.24	2185.5	696.288	497.655	339.644	213.693	178.58												

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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.	ALEDM3TY	Sample ID.	AT1
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	0.760	91.0	0.998	5.26%
277.00	60	0.357	89.2	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\*\*\*\*\*