

# Photometric Test Report

## Relevant Standards

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

## Prepared For

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## Project Number

**DLF2301106**

## Report Number

**DLF2301106-46aMOD78W**

## Test Date

**2023/2/6**

## Issue Date

**2023/2/7**

### 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		10769
Minimum Luminaire Efficacy (lm/W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Standard 105	Premium 120	142.8
Power (Input Wattage) (W) (Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		75.4
Total Harmonic Distortion (A%) (THD & PF - section 4.3)	ANSI C82.77:2014	20.00%	120V	6.33%
		20.00%	277V	13.59%
Power Factor (THD & PF - section 4.3)	ANSI C82.77:2014	0.9	120V	0.997
		0.9	277V	0.872
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		0.630
(Goniophotometer - Section 4.2)		Non-Worst Case		0.306
Power (Input Wattage - W)				
(Goniophotometer - Section 4.2)	IES LM-79-2008	Worst Case		75.4
(Goniophotometer - Section 4.2)		Non-Worst Case		74.0

## 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.

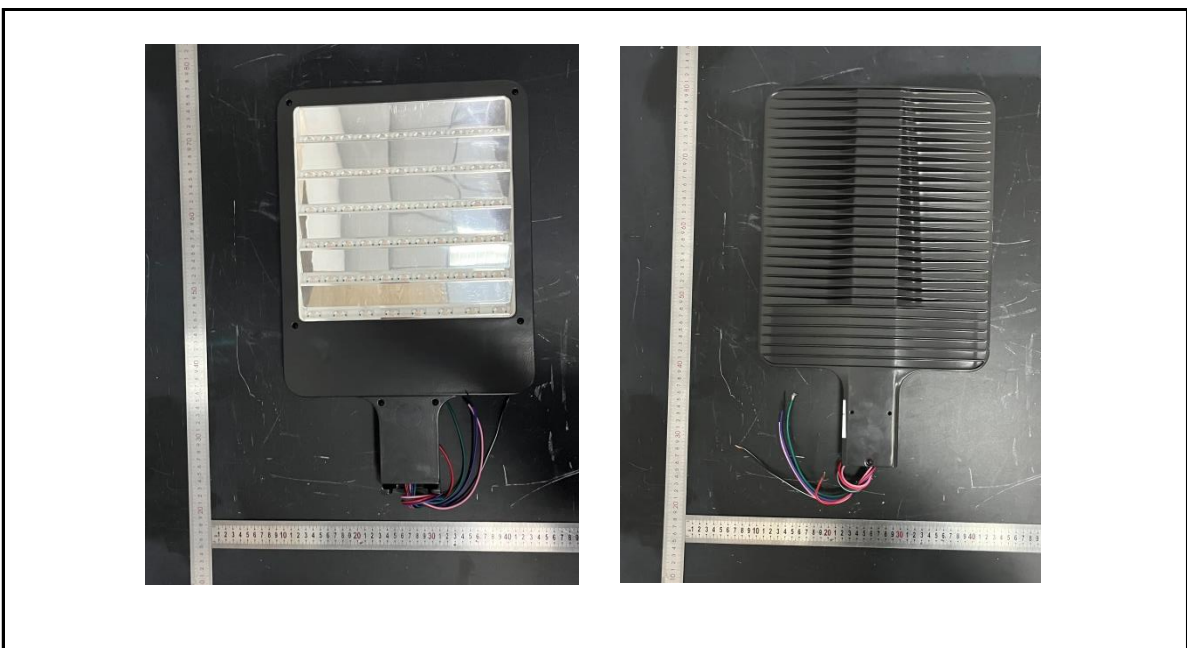
## 3.0 Production Description

**Luminaire Description:** ALEDM3TY

**Description:** 78W @ 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	0.630	75.4	0.997
277.00	60	0.306	74.0	0.872

#### 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	0.630	75.4	0.997
NON-WROST CASE	277.00	60	0.306	74.0	0.872

#### Test Result

Flux (lm)	Field Angle(10%)		Beam Angle(50%)		Luminous Efficacy (lm/W)
	C0-180	C90-270	C0-180	C90-270	
10769	91.2	164.2	37.0	152.5	142.8

Zonal Lumen Requirement ( $0^{\circ}$ - $90^{\circ}$ )	Zonal Lumen Requirement ( $80^{\circ}$ - $90^{\circ}$ )	BUG rating
100.00%	1.09%	B1-U0-G2

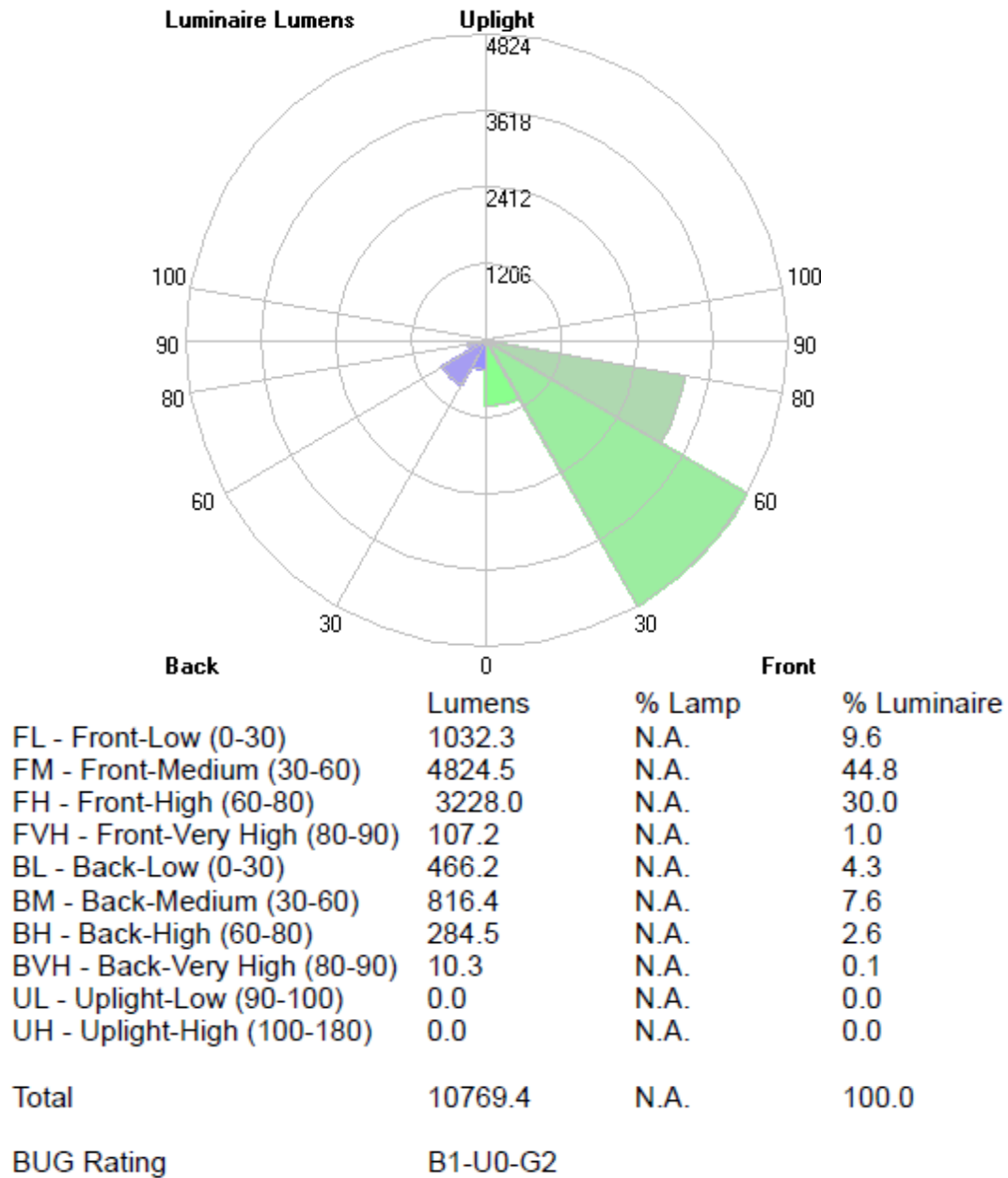
## 4.2 Goniophotometer Test

### Zonal Lumen Summary

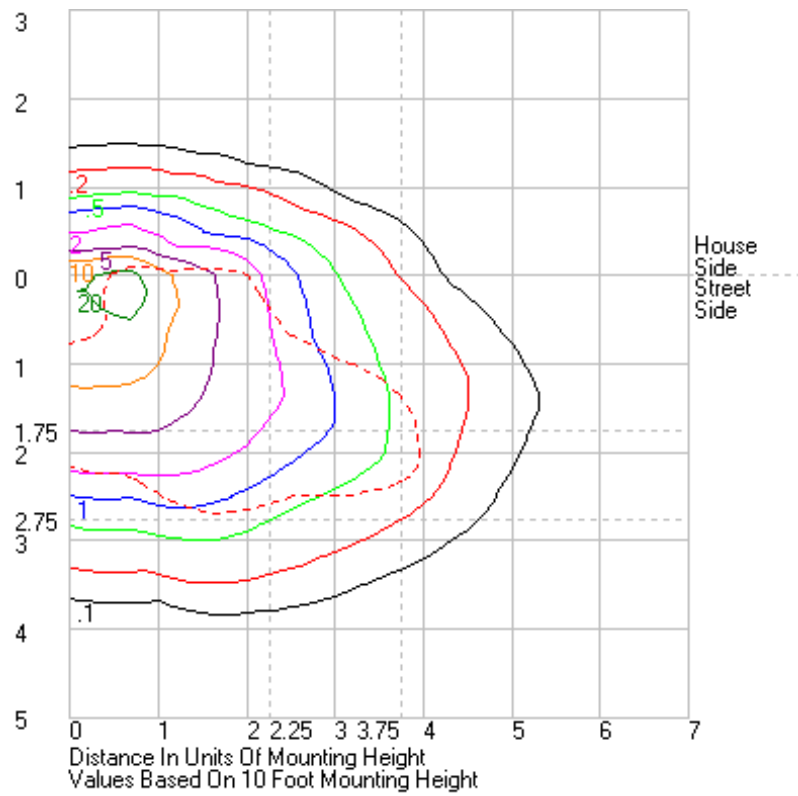
	Zonal (lm)		Total (lm)	Percent
0-10	170.00	0 - 10	170.00	1.58%
10-20	476.54	0 - 20	646.54	6.00%
20-30	851.89	0 - 30	1498.43	13.91%
30-40	1429.21	0 - 40	2927.64	27.19%
40-50	1919.94	0 - 50	4847.58	45.01%
50-60	2291.76	0 - 60	7139.34	66.29%
60-70	2322.43	0 - 70	9461.77	87.86%
70-80	1190.00	0 - 80	10651.77	98.91%
80-90	117.54	0 - 90	10769.31	100.00%
90-100	0.00	0 - 100	10769.31	100.00%
100-110	0.00	0 - 110	10769.31	100.00%
110-120	0.00	0 - 120	10769.31	100.00%
120-130	0.00	0 - 130	10769.31	100.00%
130-140	0.00	0 - 140	10769.31	100.00%
140-150	0.00	0 - 150	10769.31	100.00%
150-160	0.00	0 - 160	10769.31	100.00%
160-170	0.00	0 - 170	10769.31	100.00%
170-180	0.00	0 - 180	10769.31	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	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45	1803.45
1	1830.01	1827.27	1824.31	1820.33	1815.33	1809.41	1802.99	1796.46	1790.52	1785.01	1780.2	1777.57	1778.69	1777.57	1780.2	1785.01	1790.52	1796.46	1802.99	1809.41	1815.33	1820.33	1824.31	1827.27	1830.01
2	1858.15	1854.08	1849.78	1841.85	1832	1819.62	1806.57	1793.95	1781.45	1770.35	1760.48	1753.5	1752.86	1753.5	1760.48	1770.35	1781.45	1793.95	1806.57	1819.62	1832	1841.85	1849.78	1854.08	1858.15
3	1892.3	1887.42	1880.58	1867.64	1852.68	1833.62	1813.6	1793.56	1773.62	1751.14	1731.06	1716.63	1713.13	1716.63	1731.06	1751.14	1773.62	1793.56	1813.6	1833.62	1852.68	1867.64	1880.58	1887.42	1892.3
4	1923.73	1919.33	1910.78	1896.35	1875.06	1848.84	1821.58	1793.95	1763.18	1729.12	1695.73	1669.97	1658.71	1669.97	1695.73	1729.12	1763.18	1793.95	1821.58	1848.84	1875.06	1896.35	1910.78	1919.33	1923.73
5	1954.54	1948.88	1942.22	1926.1	1900.46	1866.93	1830.82	1795.78	1752.29	1700.08	1643.82	1598.78	1583.16	1598.78	1643.82	1700.08	1752.29	1795.78	1830.82	1866.93	1900.46	1926.1	1942.22	1948.88	1954.54
6	1982.89	1978.68	1972.01	1957.71	1927.22	1885.52	1841.13	1797.38	1738.29	1659.29	1571.74	1508.81	1482.05	1508.81	1571.74	1659.29	1738.29	1797.38	1841.13	1885.52	1927.22	1957.71	1972.01	1978.68	1982.89
7	2008.37	2004.6	2000.89	1987.6	1956.03	1906.44	1852.77	1799.78	1721.51	1607.64	1493.75	1411.22	1376.13	1411.22	1493.75	1607.64	1721.51	1799.78	1852.77	1906.44	1956.03	1987.6	2000.89	2004.6	2008.37
8	2037.34	2033.89	2031	2017.87	1985.17	1928.9	1866.08	1801.77	1698.74	1546.26	1398.18	1293.14	1253.93	1293.14	1398.18	1546.26	1698.74	1801.77	1866.08	1928.9	1985.17	2017.87	2031	2033.89	2037.34
9	2062.08	2061.72	2060.62	2047.61	2013.52	1952.68	1881.27	1804.38	1667.19	1477	1297.23	1185.16	1136.46	1185.16	1297.23	1477	1667.19	1804.38	1881.27	1952.68	2013.52	2047.61	2060.62	2061.72	2062.08
10	2081.26	2083.68	2090.91	2077.96	2044.28	1979.68	1900.39	1808.38	1632.66	1397.78	1201.02	1067.91	1018.77	1067.91	1201.02	1397.78	1632.66	1808.38	1900.39	1979.68	2044.28	2077.96	2090.91	2083.68	2081.26
11	2095.49	2101.24	2118.12	2110.96	2075.54	2011.12	1924.56	1815.4	1592.11	1314.55	1091.9	946.125	888.215	946.125	1091.9	1314.55	1592.11	1815.4	1924.56	2011.12	2075.54	2110.96	2118.12	2101.24	2095.49
12	2103.83	2113.26	2138.76	2143.13	2111.25	2048.49	1954.86	1824.86	1548.25	1233.84	992.127	836.901	778.864	836.901	992.127	1233.84	1548.25	1824.86	1954.86	2048.49	2111.25	2143.13	2138.76	2113.26	2103.83
13	2109.71	2121.37	2156.35	2175.11	2152.95	2094.12	1995.5	1839.06	1502.23	1147.57	884.905	723.667	669.519	723.667	884.905	1147.57	1502.23	1839.06	1995.5	2094.12	2152.95	2175.11	2156.35	2121.37	2109.71
14	2109.77	2127.29	2170.58	2204.63	2200.45	2151.65	2048.43	1858.9	1451.17	1060.89	786.779	622.011	568.061	622.011	786.779	1060.89	1451.17	1858.9	2048.43	2151.65	2200.45	2204.63	2170.58	2127.29	2109.77
15	2099.04	2124.7	2183.78	2234.91	2256.03	2221.78	2113.99	1885.95	1405.87	974.725	691.61	536.897	494.37	536.897	691.61	974.725	1405.87	1885.95	2113.99	2221.78	2256.03	2234.91	2183.78	2124.7	2099.04
16	2080.29	2112.35	2193.68	2267.14	2323.83	2305.35	2191.1	1922.72	1361.75	888.231	598.757	466.885	431.462	466.885	598.757	888.231	1361.75	1922.72	2191.1	2305.35	2323.83	2267.14	2193.68	2112.35	2080.29
17	2064.91	2099.98	2197.23	2300.01	2402.68	2398.52	2278.61	1963.29	1321.48	810.061	531.205	421.462	395.042	421.462	531.205	810.061	1321.48	1963.29	2278.61	2398.52	2402.68	2300.01	2197.23	2099.98	2064.91
18	2048.49	2087.86	2196.56	2340.12	2490.68	2501.61	2370.58	2007.87	1286.32	732.178	475.561	390.563	370.48	390.563	475.561	732.178	1286.32	2007.87	2340.12	2490.68	2501.61	2370.58	2196.56	2087.86	2048.49
19	2032.41	2076.83	2196.93	2384.73	2582.34	2607.79	2462.19	2050.23	1242.44	663.165	436.344	369.856	351.406	369.856	436.344	663.165	1242.44	2050.23	2462.19	2607.79	2582.34	2384.73	2196.93	2076.83	2032.41
20	2019.91	2067.96	2198.43	2432.2	2685.45	2713.35	2551.05	2090.32	1198.58	603.087	412.83	354.434	336.309	354.434	412.83	603.087	1198.58	2090.32	2551.05	2713.35	2685.45	2432.2	2198.43	2067.96	2019.91
21	2003.93	2060.55	2203.05	2484.49	2790.88	2815.14	2636.46	2119.77	1151.51	553.367	394.027	339.387	321.676	339.387	394.027	553.367	1151.51	2119.77	2636.46	2815.14	2790.88	2484.49	2203.05	2060.55	2003.93
22	1987.87	2052.02	2210.93	2541.1	2891.07	2913	2718.85	2143.84	1096.22	515.115	380.16	326.442	309.183	326.442	380.16	515.115	1096.22	2143.84	2718.85	2913	2891.07	2541.1	2210.93	2052.02	1987.87
23	1971.76	2040.69	2224.61	2607.19	2989.22	3011.77	2807.79	2161.63	1038.54	487.718	368.229	314.34	297.975	314.34	368.229	487.718	1038.54	2161.63	2807.79	3011.77	2989.22	2607.19	2224.61	2040.69	1971.76
24	1961.17	2032.36	2239.95	2676.38	3081.23	3114.94	2900.08	2179.02	974.184	471.706	357.22	303.865	287.814	303.865	357.22	471.706	974.184	2179.02	2900.08	3114.94	3081.23	2676.38	2239.95	2032.36	1961.17
25	1961	2032.85	2255.27	2749.35	3176.17	3225.88	3003.96	2196.06	912.512	460.222	347.815	295.719	279.706	295.719	347.815	460.222	912.512	2196.06	3003.96	3225.88	3176.17	2749.35	2255.27	2032.85	1961
26	1971.18	2040.52	2272.93	2821.94	3269.24	3354.69	3116.9	2215.43	851.827	451.016	338.852	287.539	271.598	287.539	338.852	451.016	851.827	2215.43	3116.9	3354.69	3269.24	2821.94	2272.93	2040.52	1971.18
27	1997.02	2060.56	2297.23	2963.47	3368.85	3491.29	3236.94	2234.8	793.955	443.619	332.266	280.854	264.047	280.854	332.266	443.619	793.955	2234.8	3236.94	3491.29	3368.85	2963.47	2297.23	2060.56	1997.02
28	2038.14	2096.68	2334.14	2894.11	3472.47	3637.94	3361.76	2253.51	743.326	436.118	326.999	274.235	257.18	274.235	326.999	436.118	743.326	2253.51	3361.76	3637.94	3472.47	2894.11	2334.14	2096.68	2038.14
29	2099.06	2156.03	2378.04	3024.69	3595.34	3789.77	3490.35	2268.06	696.497	430.282	322.255	267.704	250.064	267.704	322.255	430.282	696.497	2268.06	3490.35	3789.77	3595.34	3024.69	2378.04	2156.03	2099.06
30	2161.17	2228.12	2438.65	3082.81	3726.93	3949.88	3618.19	2275.53	654.064	425.141	318.548	261.603	243.296	261.603	318.548	425.141	654.064	2275.53	3618.19	3949.88	3726.93	3082.81	2438.65	2228.12	2161.17
31	2248.39	2315.56	2513.88	3136.22	3862.43	4109.85	3736.76	2274.68	624.973	420.023	314.903	254.422	236.484	254.422	314.903	420.023	624.973	2274.68	3736.76	4109.85	3862.43	3136.22	2513.88	2315.56	2248.39
32	2347.99	2419.29	2609.49	3187.38	4000.73	4262.61	3845.84	2262.15	603.34	416.846	311.505	247.715	229.617	247.715	311.505	416.846	603.34	2262.15	3845.84	4262.61	4000.73	3187.38	2609.49	2419.29	2347.99
33	2456.32	2528.6	2716.25	3248.32	4140.46	4408.77	3941.83	2230.26	592.965	414.336	307.964	240.875	223.384	240.875	307.964	414.336	592.965	2230.26	3941.83	4408.77	4140.46	3248.32	2716.25	2528.6	2456.32
34	2592.39	2654.94	2829.52	3314.84	4269.14	4540.59	4020.31	2180.63	587.571	412.791	303.672	233.506	213.489	233.506	303.672	412.791	587.571	2180.63	4020.31	4540.59	4269.14	3314.84	2829.52	2654.94	2592.39
35	2718.88	2779.72	2952.49	3394.98	4392.93	4659.09	4081.8	2113.17	584.537	412.869	300.253	224.962	201.509	224.962	300.253	412.869	584.537	2113.17	4081.8	4659.09	4392.93	3394.98	2952.49	2779.72	2718.88
36	2857.21	2919.06	3087.73	3489.84	4503.28	4758.65	4124.42	2033.12	583.892	414.093	296.7	211.989	185.369	211.989	296.7	414.093	583.892	2033.12	4124.42	4758.65	4503.28	3489.84	3087.73	2919.06	2857.21
37	2986.77	3060.77	3225.49	3597.36	4594.25	4837.85	4142.97	1940.78	583.434	415.798	292.144	196.191	166.847	196.191	292.144	415.798	583.434	1940.78	4142.97	4837.85	4594.25	3597.36	3225.49	3060.77	2986.77
38	3097.28	3185.44	3369.35	3714.56	4660.99	4894.23	4141.69	1833.72	584.211	417.552	284.974	179.													

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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	0.630	75.4	0.997	6.33%
277.00	60	0.306	74.0	0.872	13.59%

## 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\*\*\*\*\*