



## Photometric Test Report

### Relevant Standards

- ☒ IES LM-79-2008
- ☒ ANSI C82.77-10-2014
- ☐ UL1598-2008

### Prepared For

### Beyond LED Technology

1939 Parker Court, Stone Mountain, GA 30087

Test Laboratory: UL Verification Services (Guangzhou) Co., Ltd.

Test Laboratory Address: 1-3F & Room 501, Building 2 (R&D Center A1), No. 25, South Huanshi Avenue, Nansha District, Guangzhou 511458, China

### Catalog Number

ZPS-MB422-70W-V1-T2-E3-D2-D-T3

### Project Number

4790039593

### Report Number

4790039593-9a

### Test Date

2/11/2022

### Issue Date

3/14/2022

### Revision Date

N/A

Prepared By

Becky Fan

Becky Fan

Approved By

Susie Shao

Susie Shao

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

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## 1.0 Test List

Sample Received Date: 2022-01-17

| Test No. | Test Item            | Sample ID | Model Number                   | Test Conducted By |
|----------|----------------------|-----------|--------------------------------|-------------------|
| 1        | Goniophotometer Test | 4588478   | ZPS-MB422-70W-V1-T2-E3-D2-D-T3 | Lily Chen         |
| 2        | THD and PF Test      | 4588478   | ZPS-MB422-70W-V1-T2-E3-D2-D-T3 | Lily Chen         |

### Remark (if any)

[ X ] 1. UL test equipment information is recorded on Meter Use in UL's Aurora database.



## 2.0 Product Description

Luminaire Description: Outdoor Full-Cutoff Wall-Mounted Area Luminaires

Model Number: ZPS-MB422-70W-V1-T2-E3-D2-D-T3

Electrical Ratings and CCT: 120-277 Vac, 50/60 Hz, 70 W max., 4000K

Driver Model Number: GY-75W-105V-0690-UNV-10-H-ADJ1

LED Package: SPMWH\*326FP\*\*\*\*\*

Family Model and Variation: ZPS-MB422-70W.V1-T2-E3-D1-[D;B;W;G]-T3 (Where [D;B;W;G] represents lamp color different: D=dark bronze; B=black; W=white; G=gray)

### Photos of Luminaire Characteristics





### 3.0 LM-79 Measurement and Test Results

#### 3.1 Goniophotometer Test

|                     |                                |                           |         |
|---------------------|--------------------------------|---------------------------|---------|
| Model No.           | ZPS-MB422-70W-V1-T2-E3-D2-D-T3 | Sample ID.                | 4588478 |
| Operate time (Min.) | 60                             | Stabilization time (Min.) | 50      |

#### Test Method

- 1.The sample was tested according to the IES LM-79-2008, and the product is assume to be brand new without seasoning.
- 2.Photometric paramters were measured using a type C goniophotometer and software.
- 3.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 reference standard lamp is power 1000W omni-directional Incandescent lamp and was calibrated by National Institute of Metrology, China.
- 4.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  $1^{\circ}$  vertical intervals and  $22.5^{\circ}$  horizontal intervals. Photometric distance was more than five times of the largest dimension of the test SSL product.

#### Goniophotometer Test Conditions

|                  |               |                |             |           |              |               |
|------------------|---------------|----------------|-------------|-----------|--------------|---------------|
| Temperature (°C) | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor | Orientation   |
| 24.8             | 120.04        | 60             | 0.582       | 68.55     | 0.9812       | straight down |

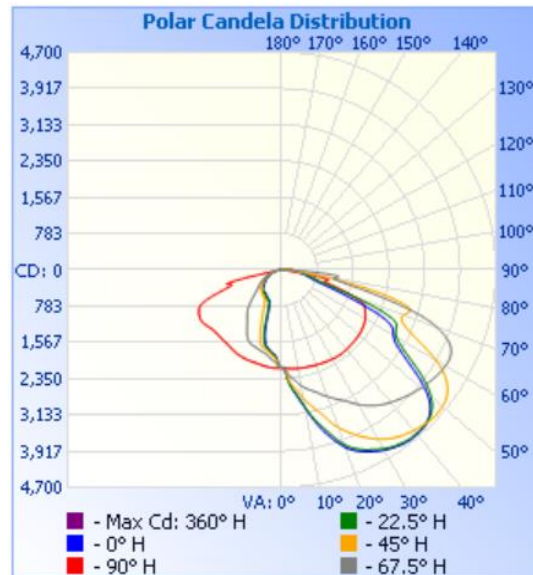
#### Test Result

| Zonal Lumen Requirement (0°-90°)  | Field Angle (10%) |                 | Beam Angle (50%)  |                 | Flux (lm) | Luminous Efficacy (lm/W) |
|-----------------------------------|-------------------|-----------------|-------------------|-----------------|-----------|--------------------------|
|                                   | Horizontal Spread | Vertical Spread | Horizontal Spread | Vertical Spread |           |                          |
| 99.3%                             | 157.2             | 133.7           | 135.7             | 62.8            | 10607.7   | 154.74                   |
| Zonal Lumen Requirement (80°-90°) | BUG Ratings       |                 |                   |                 |           |                          |
|                                   | Backlight         | Uplight         | Glare             |                 |           |                          |
| 2.6%                              | B2                | U2              | G3                |                 |           |                          |

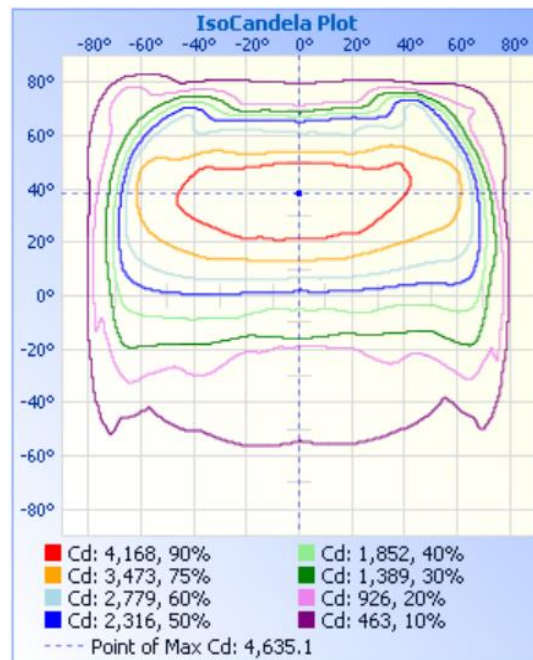


### 3.1 Goniophotometer Test (Cont'd)

#### Light Distribution Curve



#### IsoCandela Plot





### 3.1 Goniophotometer Test (Cont'd)

#### Zonal Lumen Summary

##### **Zonal Lumen Summary**

| Zone   | Lumens   | % Luminaire |
|--------|----------|-------------|
| 0-30   | 1,999.8  | 18.9%       |
| 0-40   | 3,553.1  | 33.5%       |
| 0-60   | 7,429.0  | 70%         |
| 60-90  | 3,099.9  | 29.2%       |
| 70-100 | 1,372.3  | 12.9%       |
| 90-120 | 62.2     | 0.6%        |
| 0-90   | 10,528.9 | 99.3%       |
| 90-180 | 78.8     | 0.7%        |
| 0-180  | 10,607.7 | 100%        |

#### Lumens Per Zone

##### **Lumens Per Zone**

| Zone  | Lumens  | % Total | Zone    | Lumens | % Total |
|-------|---------|---------|---------|--------|---------|
| 0-10  | 211.1   | 2.0%    | 90-100  | 49.1   | 0.5%    |
| 10-20 | 671.2   | 6.3%    | 100-110 | 8.4    | 0.1%    |
| 20-30 | 1,117.5 | 10.5%   | 110-120 | 4.7    | 0%      |
| 30-40 | 1,553.3 | 14.6%   | 120-130 | 4.5    | 0%      |
| 40-50 | 1,900.5 | 17.9%   | 130-140 | 4.1    | 0%      |
| 50-60 | 1,975.4 | 18.6%   | 140-150 | 3.3    | 0%      |
| 60-70 | 1,776.7 | 16.7%   | 150-160 | 2.4    | 0%      |
| 70-80 | 1,050.8 | 9.9%    | 160-170 | 1.6    | 0%      |
| 80-90 | 272.5   | 2.6%    | 170-180 | 0.7    | 0%      |



### 3.1 Goniophotometer Test (Cont'd)

#### Intensity Data(cd)

|     | 0    | 22.5 | 45   | 67.5 | 90   | 112.5 | 135  | 157.5 | 180  | 202.5 | 225  | 247.5 | 270  | 292.5 | 315  | 337.5 | 360  |
|-----|------|------|------|------|------|-------|------|-------|------|-------|------|-------|------|-------|------|-------|------|
| 0   | 2117 | 2117 | 2117 | 2117 | 2117 | 2117  | 2117 | 2117  | 2117 | 2117  | 2117 | 2117  | 2117 | 2117  | 2117 | 2117  | 2117 |
| 1   | 2101 | 2147 | 2143 | 2129 | 2119 | 2110  | 2106 | 2107  | 2095 | 2105  | 2108 | 2117  | 2128 | 2127  | 2136 | 2147  | 2140 |
| 2   | 2209 | 2188 | 2175 | 2149 | 2119 | 2090  | 2073 | 2060  | 2055 | 2066  | 2073 | 2097  | 2127 | 2145  | 2171 | 2185  | 2188 |
| 3   | 2341 | 2361 | 2308 | 2222 | 2126 | 2038  | 1979 | 1951  | 1937 | 1950  | 1981 | 2041  | 2127 | 2210  | 2296 | 2353  | 2372 |
| 4   | 2456 | 2496 | 2417 | 2285 | 2134 | 2000  | 1921 | 1889  | 1871 | 1891  | 1924 | 2001  | 2126 | 2264  | 2401 | 2488  | 2513 |
| 5   | 2564 | 2581 | 2495 | 2330 | 2138 | 1976  | 1890 | 1855  | 1838 | 1853  | 1893 | 1975  | 2127 | 2306  | 2476 | 2578  | 2605 |
| 6   | 2659 | 2646 | 2550 | 2368 | 2141 | 1956  | 1866 | 1833  | 1818 | 1833  | 1870 | 1955  | 2125 | 2340  | 2532 | 2644  | 2671 |
| 7   | 2751 | 2708 | 2600 | 2404 | 2145 | 1938  | 1846 | 1811  | 1801 | 1816  | 1850 | 1937  | 2123 | 2371  | 2580 | 2701  | 2737 |
| 8   | 2847 | 2811 | 2669 | 2454 | 2150 | 1914  | 1819 | 1783  | 1773 | 1792  | 1825 | 1910  | 2120 | 2416  | 2648 | 2790  | 2844 |
| 9   | 2946 | 2924 | 2759 | 2507 | 2155 | 1890  | 1795 | 1760  | 1745 | 1764  | 1800 | 1886  | 2116 | 2465  | 2725 | 2905  | 2968 |
| 10  | 3054 | 3034 | 2838 | 2551 | 2158 | 1868  | 1775 | 1736  | 1717 | 1737  | 1778 | 1865  | 2110 | 2508  | 2801 | 3013  | 3093 |
| 11  | 3169 | 3145 | 2913 | 2588 | 2161 | 1852  | 1758 | 1717  | 1694 | 1714  | 1760 | 1849  | 2106 | 2546  | 2870 | 3118  | 3222 |
| 12  | 3285 | 3251 | 2977 | 2622 | 2164 | 1842  | 1747 | 1702  | 1666 | 1691  | 1744 | 1834  | 2102 | 2577  | 2933 | 3225  | 3341 |
| 13  | 3406 | 3352 | 3043 | 2655 | 2165 | 1831  | 1733 | 1680  | 1606 | 1655  | 1732 | 1824  | 2097 | 2606  | 2990 | 3326  | 3449 |
| 14  | 3524 | 3443 | 3110 | 2684 | 2167 | 1820  | 1726 | 1638  | 1523 | 1599  | 1719 | 1815  | 2096 | 2632  | 3050 | 3420  | 3541 |
| 15  | 3627 | 3532 | 3177 | 2716 | 2171 | 1812  | 1713 | 1568  | 1423 | 1523  | 1702 | 1805  | 2091 | 2655  | 3108 | 3502  | 3623 |
| 16  | 3722 | 3623 | 3258 | 2747 | 2172 | 1803  | 1696 | 1451  | 1286 | 1420  | 1672 | 1797  | 2090 | 2685  | 3182 | 3586  | 3709 |
| 17  | 3816 | 3724 | 3353 | 2789 | 2177 | 1792  | 1663 | 1303  | 1117 | 1277  | 1625 | 1786  | 2089 | 2722  | 3265 | 3675  | 3810 |
| 18  | 3909 | 3830 | 3454 | 2832 | 2181 | 1782  | 1609 | 1150  | 945  | 1108  | 1555 | 1776  | 2087 | 2759  | 3359 | 3774  | 3917 |
| 19  | 3998 | 3926 | 3543 | 2870 | 2184 | 1773  | 1544 | 1013  | 837  | 959   | 1465 | 1766  | 2084 | 2795  | 3449 | 3874  | 4017 |
| 20  | 4079 | 4013 | 3616 | 2907 | 2187 | 1766  | 1463 | 904   | 768  | 856   | 1364 | 1757  | 2085 | 2828  | 3531 | 3962  | 4101 |
| 25  | 4330 | 4284 | 3948 | 3106 | 2205 | 1740  | 1066 | 714   | 698  | 707   | 949  | 1702  | 2074 | 2971  | 3847 | 4248  | 4334 |
| 30  | 4498 | 4462 | 4221 | 3354 | 2223 | 1646  | 789  | 680   | 660  | 677   | 740  | 1533  | 2046 | 3116  | 4103 | 4420  | 4498 |
| 35  | 4606 | 4572 | 4410 | 3577 | 2237 | 1503  | 705  | 640   | 619  | 633   | 698  | 1322  | 2009 | 3255  | 4272 | 4543  | 4610 |
| 40  | 4629 | 4606 | 4525 | 3732 | 2230 | 1385  | 675  | 606   | 616  | 605   | 664  | 1175  | 1990 | 3371  | 4357 | 4583  | 4631 |
| 45  | 4557 | 4564 | 4604 | 3860 | 2215 | 1237  | 629  | 588   | 588  | 598   | 623  | 961   | 1982 | 3489  | 4421 | 4551  | 4555 |
| 50  | 4180 | 4286 | 4601 | 3980 | 2201 | 1014  | 578  | 562   | 512  | 566   | 570  | 741   | 1993 | 3608  | 4459 | 4326  | 4140 |
| 55  | 3307 | 3541 | 4446 | 4077 | 2172 | 811   | 517  | 506   | 450  | 495   | 511  | 614   | 2054 | 3759  | 4417 | 3637  | 3270 |
| 60  | 2835 | 2904 | 3920 | 4147 | 2118 | 643   | 457  | 435   | 395  | 423   | 454  | 517   | 2076 | 3942  | 4144 | 2894  | 2835 |
| 65  | 2486 | 2783 | 3050 | 4102 | 2016 | 486   | 387  | 369   | 334  | 355   | 382  | 422   | 2007 | 3932  | 3407 | 2728  | 2469 |
| 70  | 1184 | 1721 | 2848 | 3637 | 1682 | 343   | 307  | 285   | 259  | 281   | 301  | 331   | 1580 | 3520  | 2919 | 1993  | 1149 |
| 75  | 641  | 750  | 2705 | 2273 | 989  | 243   | 225  | 203   | 187  | 204   | 221  | 242   | 1196 | 2034  | 3198 | 791   | 635  |
| 80  | 458  | 526  | 1214 | 1186 | 740  | 160   | 147  | 129   | 112  | 129   | 144  | 162   | 204  | 858   | 1476 | 522   | 459  |
| 85  | 309  | 359  | 303  | 1055 | 89   | 81    | 68   | 60    | 45   | 57    | 68   | 84    | 93   | 481   | 289  | 368   | 304  |
| 90  | 181  | 209  | 187  | 138  | 28   | 24    | 30   | 30    | 25   | 30    | 31   | 27    | 29   | 86    | 176  | 219   | 179  |
| 95  | 97   | 109  | 92   | 33   | 9    | 9     | 11   | 12    | 12   | 12    | 10   | 9     | 8    | 24    | 78   | 118   | 97   |
| 100 | 47   | 51   | 30   | 8    | 5    | 7     | 7    | 4     | 4    | 4     | 5    | 7     | 5    | 6     | 23   | 53    | 46   |
| 105 | 13   | 13   | 4    | 3    | 5    | 8     | 8    | 5     | 4    | 5     | 6    | 7     | 4    | 3     | 3    | 13    | 13   |
| 110 | 2    | 2    | 2    | 3    | 5    | 8     | 9    | 6     | 5    | 6     | 7    | 7     | 4    | 2     | 1    | 2     | 2    |
| 115 | 1    | 1    | 2    | 3    | 5    | 9     | 9    | 7     | 6    | 6     | 8    | 7     | 5    | 3     | 2    | 1     | 1    |
| 120 | 1    | 1    | 2    | 3    | 6    | 9     | 9    | 7     | 6    | 7     | 9    | 8     | 5    | 3     | 1    | 1     | 1    |
| 125 | 1    | 1    | 2    | 3    | 6    | 9     | 9    | 8     | 7    | 7     | 9    | 8     | 5    | 3     | 2    | 2     | 1    |
| 130 | 1    | 1    | 2    | 4    | 6    | 9     | 9    | 8     | 7    | 8     | 9    | 8     | 5    | 3     | 2    | 2     | 1    |
| 135 | 1    | 1    | 2    | 4    | 6    | 9     | 9    | 8     | 8    | 8     | 9    | 8     | 5    | 3     | 2    | 2     | 2    |
| 140 | 1    | 2    | 2    | 4    | 6    | 8     | 9    | 9     | 8    | 8     | 9    | 8     | 5    | 3     | 2    | 2     | 2    |
| 145 | 1    | 2    | 3    | 4    | 6    | 8     | 9    | 9     | 8    | 8     | 8    | 7     | 5    | 3     | 2    | 2     | 2    |
| 150 | 2    | 2    | 3    | 4    | 6    | 7     | 8    | 8     | 8    | 8     | 8    | 7     | 5    | 4     | 3    | 2     | 2    |
| 155 | 2    | 3    | 3    | 4    | 6    | 7     | 8    | 7     | 7    | 7     | 7    | 6     | 5    | 4     | 3    | 3     | 3    |
| 160 | 3    | 3    | 4    | 5    | 5    | 6     | 7    | 7     | 7    | 7     | 7    | 6     | 5    | 4     | 3    | 3     | 3    |
| 165 | 3    | 4    | 5    | 6    | 6    | 7     | 7    | 7     | 7    | 7     | 7    | 6     | 6    | 5     | 4    | 4     | 4    |
| 170 | 5    | 5    | 6    | 6    | 6    | 7     | 7    | 7     | 8    | 8     | 8    | 7     | 7    | 7     | 6    | 5     | 5    |
| 175 | 6    | 6    | 7    | 7    | 6    | 7     | 7    | 7     | 7    | 7     | 8    | 8     | 7    | 7     | 7    | 7     | 6    |
| 180 | 7    | 7    | 7    | 7    | 7    | 7     | 7    | 7     | 7    | 7     | 7    | 7     | 7    | 7     | 7    | 7     | 7    |



#### 4.0 THD and PF Test

|                  |                                |                   |         |
|------------------|--------------------------------|-------------------|---------|
| <b>Model No.</b> | ZPS-MB422-70W-V1-T2-E3-D2-D-T3 | <b>Sample ID.</b> | 4588478 |
|------------------|--------------------------------|-------------------|---------|

#### Test Method

1. The samples were tested according to the ANSI C82.77-10-2014.
2. The ambient temperature condition was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ . The sample measurement was made using a digital power meter and power supply. The sample was operated at rated voltage and stabilized before measurement. The total harmonic distortion were calculated from the digital power meter.

#### Test Results

| Temperature (°C) | Voltage (Vac) | Frequency (Hz) | Current (A) | Power (W) | Power Factor | Current THD |
|------------------|---------------|----------------|-------------|-----------|--------------|-------------|
| 24.8             | 120           | 60             | 0.582       | 68.55     | 0.9812       | 11.56%      |
| 24.8             | 277           | 60             | 0.261       | 68.49     | 0.9473       | 15.50%      |



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