



Shenzhen Belling Efficiency Testing Lab Co., Ltd



Report No.: BL230911001-9

Date of issue 2023-10-18  
Version 1.0  
Total pages 29

## Test report of

**IES LM-79-08**

## Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products

**Applicant:**

Beyond LED Technology

**Address:**

1939 Parker Court, Stone Mountain, GA 30087

**For Product:**

1x4 Luminaires for Ambient Lighting of Interior Commercial Spaces

**Model No.:**

PL1X4-40W-A5C5-P

Test laboratory: Shenzhen Belling Efficiency Testing Lab Co., Ltd, 1Floor, No.1 Building, Meibaohe Industrial Park, Dalang Street, Longhua District, Shenzhen, Guangdong Prov.518101 China.

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Complied by: Sam Chen

Review by: Jason Zhou

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Project Engineer

Technical Manager

Note: The test data was only valid for the test sample(s). This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Shenzhen Belling Efficiency Testing Lab Co., Ltd. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.



# 1 General

## 1.1 Product Information

|                                 |   |
|---------------------------------|---|
| <b>Manufacturer</b>             | Beyond LED Technology   |
| <b>Manufacturer Address</b>     | 1939 Parker Court, Stone Mountain, GA 30087                       |
| <b>Brand Name</b>               | Beyond LED Technology   |
| <b>Luminaire Type</b>           | 1x4 Luminaires for Ambient Lighting of Interior Commercial Spaces |
| <b>Model Number</b>             | PL1X4-40W-A5C5-P  |
| <b>Rated Inputs</b>             | AC 120-277V, 50/60Hz  |
| <b>Field-Adjustable Product</b> | Yes, Watting setting: 20W, 25W, 30W, 35W, 40W                     |
| <b>Color-Tunable Product</b>    | Yes, CCT setting: 3000K, 3500K, 4000K, 5000K, 6500K               |
| <b>Dimming Capability</b>       | Continuous  |
| <b>Integral Control Sensors</b> | Optional  |
| <b>Date of Receipt Samples</b>  | 2023-09-11  |
| <b>Date of test</b>             | 2023-09-12 to 2023-09-15  |
| <b>Burning Time Before Test</b> | 0hour(For New Products)   |

## 1.2 Standards or methods

- ANSI C78.377-2017:Specifications for the Chromaticity of Solid State Lighting Products
- ANSI C82.77-10:2014:Harmonic Emission Limits - Related Power Quality Requirements for Lighting Equipment - Solid State
- CIE Publication No.13.3-1995:Method of Measuring and Specifying Color Rendering of Light Sources
- IESNA LM-79-08 Approved Method: Electric & Photometric Measurement of Solid-state Lighting Products



### 1.3 Equipment list

| Device                                       | Manufacture | Model No. | Serial No.           | Calibration due date |
|--|-------------|-----------|----------------------|----------------------|
| Goniophotometric System                      | SENSING     | GMS-3000  | M101758514120<br>011 | 2024-03-27           |
| AC Power Source                              | ALL POWER   | APW-105N  | N.A                  | 2024-03-27           |
| Total Luminous Flux Standard Lamp            | SENSING     | 110V/100W | S13100188            | 2024-04-03           |
| Total Luminous Flux Standard Lamp            | OSRAM       | 12V/20W   | LSD12201737          | 2024-04-03           |
| Total Spectral Radiant Flux Standard Lamp    | Everfine    | D204      | M133806CA141<br>1205 | 2024-04-03           |
| Digital Power Meter                          | YOKOGAWA    | WT310     | N.A                  | 2024-03-27           |
| Thermostatic stabilized photometric sphere   | SENSING     | SPR-600M  | N.A                  | 2024-03-27           |
| Plant spectral photosynthetically radiometer | Everfine    | SP-20     | P612946CF1411<br>115 | 2024-03-27           |
| Digital Power Meter                          | YOKOGAWA    | WT210     | N.A                  | 2024-03-27           |
| Spectral radiometer                          | SENSING     | SPR-3000  | S1101108             | 2024-03-27           |
| Environment Measurer                         | XUYAO       | HS-1      | N/A                  | 2024-03-31           |
| Environment Measurer                         | XUYAO       | HS-1      | N/A                  | 2024-03-31           |
| Stop watch                                   | KISLO       | K610      | N/A                  | 2024-04-19           |
| Digital Anemometer                           | TECMAN      | TD8901    | 026141               | 2024-09-06           |

Statement of Traceability: Shenzhen Belling Efficiency Testing Lab Co., Ltd attests that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit (SI).



## 2 Test conducted and method

### 2.1 Ambient Condition

The ambient temperature in which measurements are being taken was maintained at  $25^{\circ}\text{C} \pm 1^{\circ}\text{C}$ , the air flow around the sample(s) being tested did not affect the performance.

### 2.2 Power Supply Characteristics

The AC power supply had a sinusoidal voltage wave shape at the prescribed frequency (60 Hz) such that the RMS summation of the harmonic components does not exceed 3 percent of the fundamental during operation of the test item.

The voltage of AC power supply (RMS voltage) applied to the device under test was regulated to within  $\pm 0.2$  percent under load.

### 2.3 Seasoning and Stabilization

No seasoning was performed in accordance with IESNA LM-79-08. And before the measurement, the sample was stabilized until the light output and power variations were less than 0.5% in 30 minutes intervals (3 readings, 15 minutes apart).

### 2.4 Integrating Sphere System

The system includes AC power source, digital power meter, DC power supply, spectrophotometer, and integrating sphere. The integrating sphere system is calibrated by standard light source before measurement. The system and standard light source has been calibrated regularly and traceable to the National Primary Standards.  $4\pi$  geometry was used during measurement. The product was operated in its intended orientation in application and was recorded in this report.

Integrating Sphere Uncertainty: The uncertainty of the light output (luminous flux) measurements is  $U=1.8\%$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the correlated color temperature measurements is  $U=20\text{K}$  ( $K=2$ ), at the 95% confidence level. The uncertainty of the CRI is  $U=1.8(K=2)$ , at the 95% confidence level. The uncertainty of power meter AC current  $U=0.18\%$  of rdg, AC Voltage  $U=0.16\%$  of rdg, Power  $U=0.20\%$  ( $K=2$ ), at the 95% confidence level.



## 2.5 Goniophotometer System

The goniophotometer system is calibrated by standard light source before measurement. The standard light source has been calibrated regularly and traceable to the National Primary Standards.

Type C goniophotometer was used for measuring total luminous flux, luminous intensity distribution, and color spatial uniformity. The product was operated in its intended orientation in application and was recorded in this report. The method according to IESNA LM-79-08 following chapter.

Goniophotometer Uncertainty: The uncertainty of the luminous intensity is  $U=1.6\%$  ( $K=2$ ), at the 95% confidence level.



## 3 Test Result Summary

### 3.1 Integrating Sphere System (Total operating time for integrating sphere test: 1.0 hour)

#### 3.1.1 Model Number: PL1X4-40W-A5C5-P-[Blank;M;I;B;E] , 3000K

##### Electrical data

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.06           | 60             | 0.336             | 40.17     | 0.995        |

##### Photometric data

| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 5045.97            | 125.6           | 2973    |

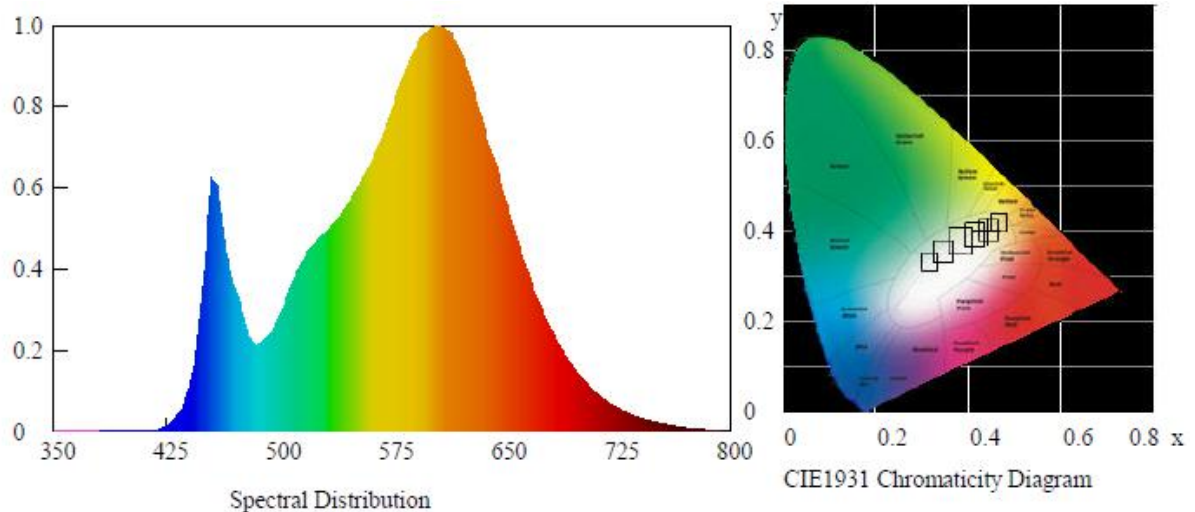
##### Chromaticity Coordinate

| Duv      | x      | y      | u'     | v'     |
|----------|--------|--------|--------|--------|
| -0.00209 | 0.4358 | 0.3985 | 0.2523 | 0.5190 |

##### Color Rendering

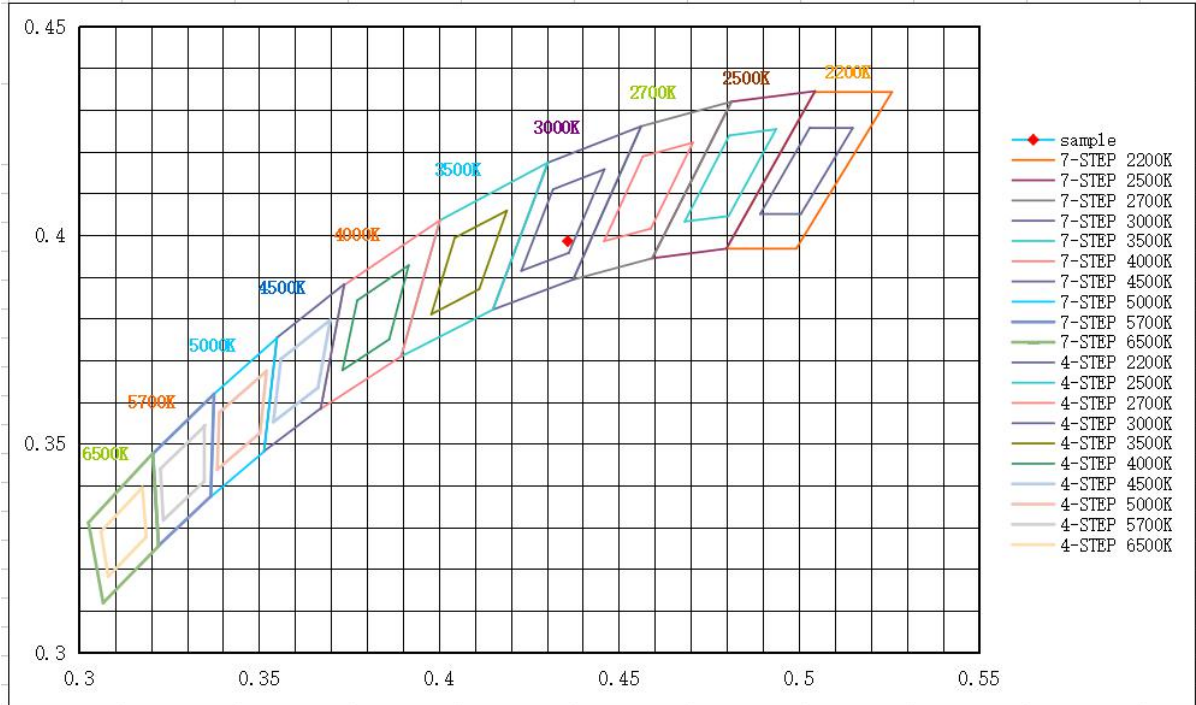
| CRI  | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 83.5 | 12 | 84 | 94 | -11       |

##### Spectral Distribution





### 7/4 Step Quadrangle





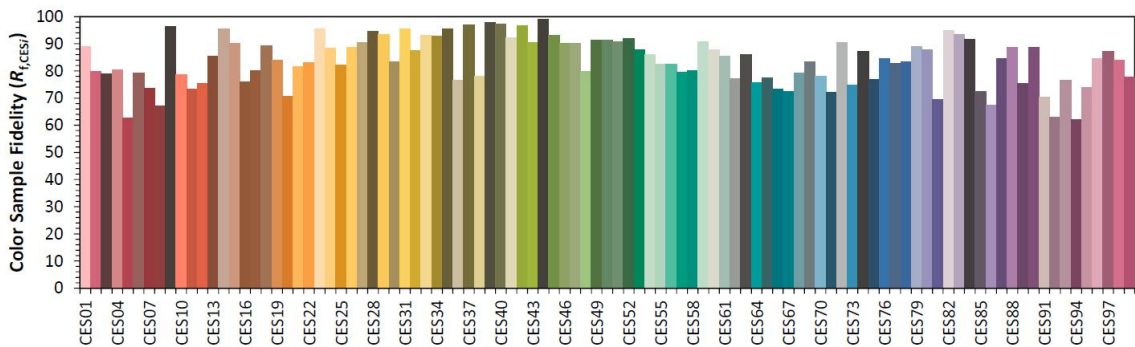
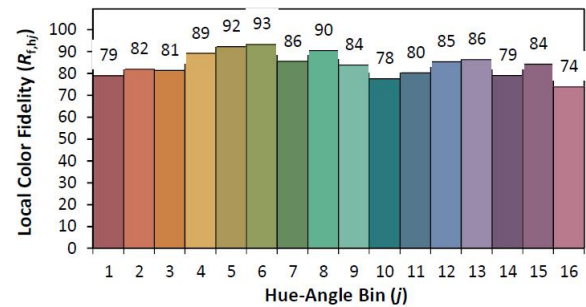
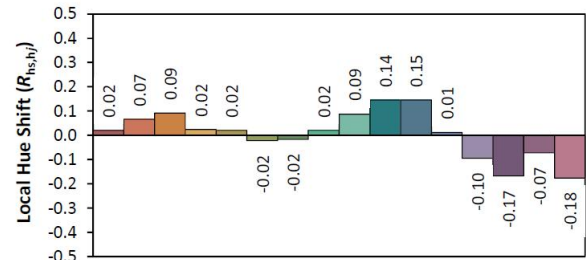
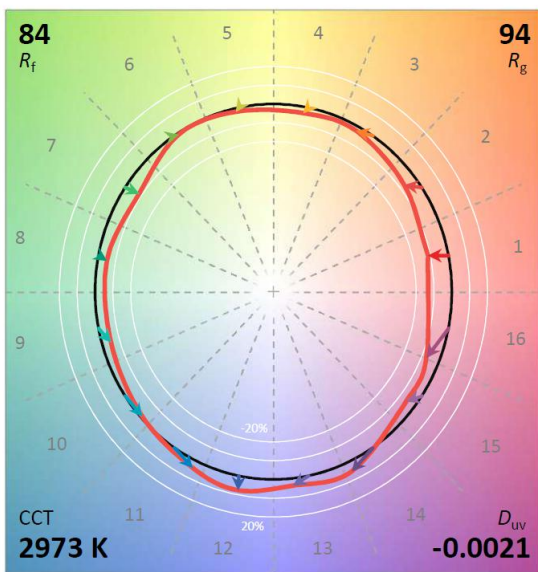
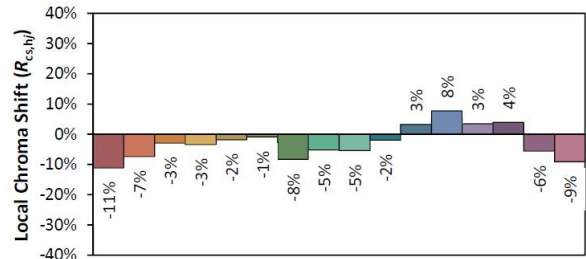
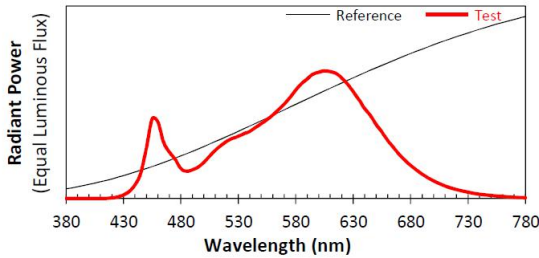
### ANSI/IES TM-30-18 Color Rendition Report

Source: BL230911001-9

Manufacturer: RZ Lighting Co Ltd

Date: 2023-10-18

Model: PL1X4-40W-A5C5-P-[Blank;M;l;B;E] , 3000K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.4358  
 $y$  0.3985  
 $u'$  0.2523  
 $v'$  0.5190

|                     |    |
|---------------------|----|
| CIE 13.3-1995 (CRI) |    |
| $R_a$               | 84 |
| $R_g$               | 12 |

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.





### 3.1.2 Model Number: PL1X4-40W-A5C5-P-[Blank;M;I;B;E] , 3500K

#### Electrical data

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.12           | 60             | 0.336             | 40.09     | 0.993        |

#### Photometric data

| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 5083.63            | 126.8           | 3450    |

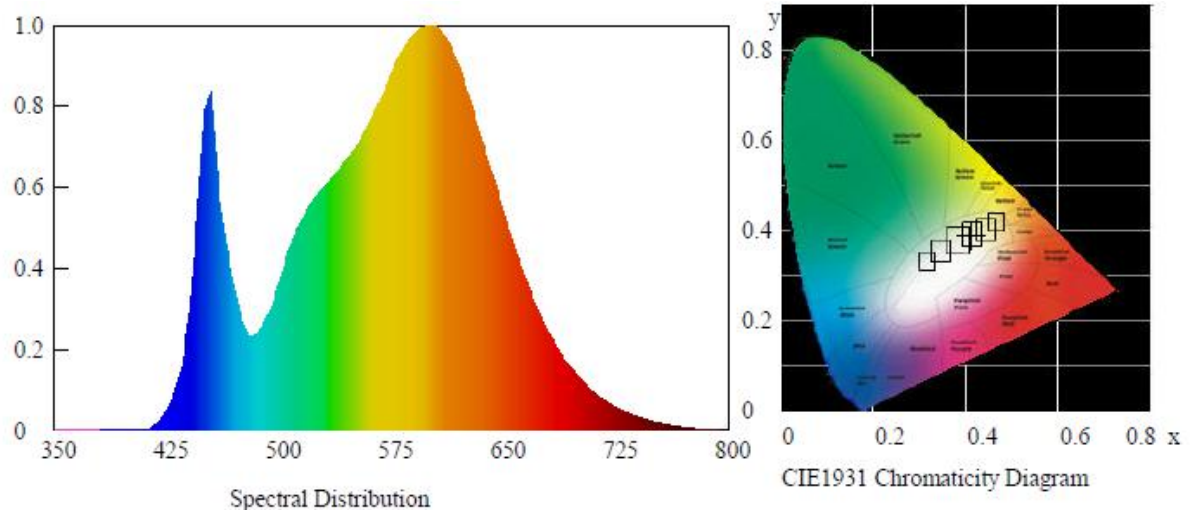
#### Chromaticity Coordinate

| Duv      | x      | y      | u'     | v'     |
|----------|--------|--------|--------|--------|
| -0.00157 | 0.4065 | 0.3877 | 0.2377 | 0.5102 |

#### Color Rendering

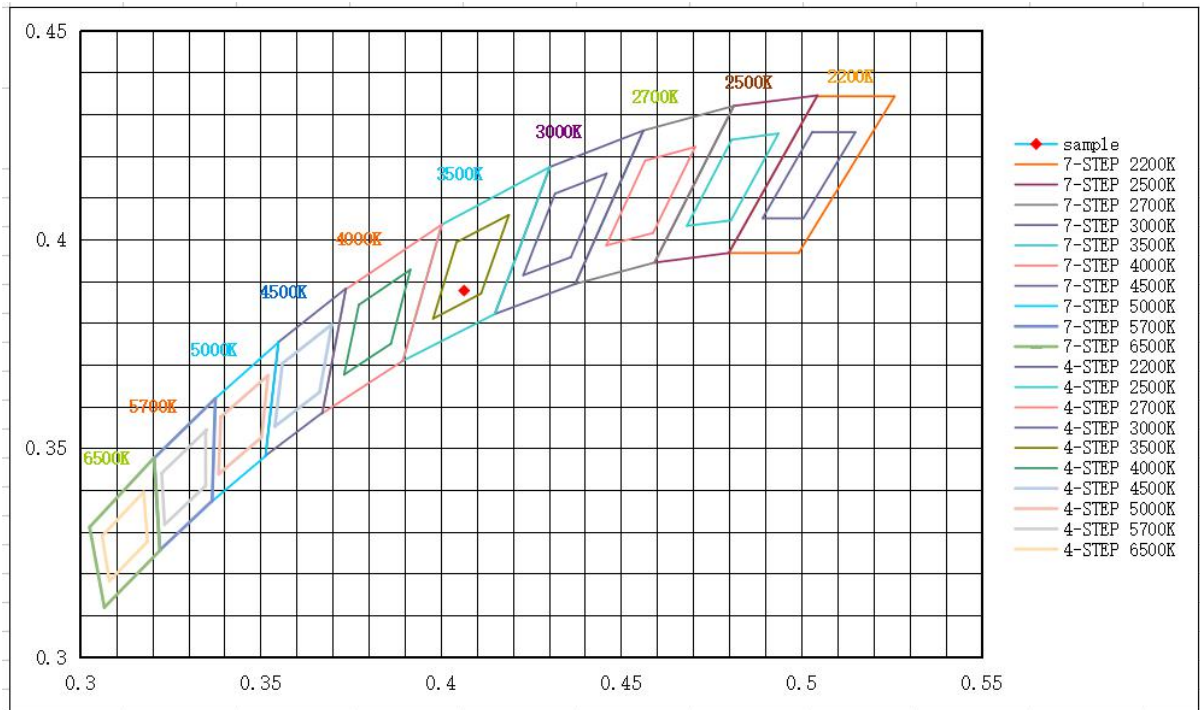
| CRI  | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 83.2 | 9  | 84 | 96 | -12       |

#### Spectral Distribution





### 7/4 Step Quadrangle





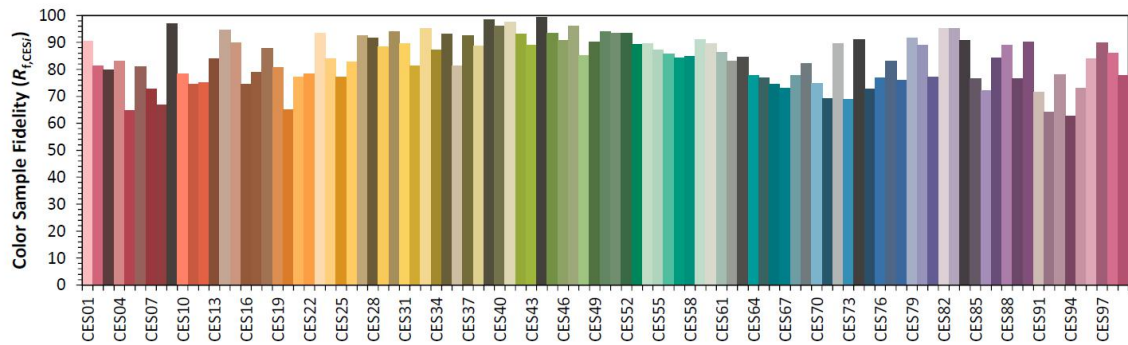
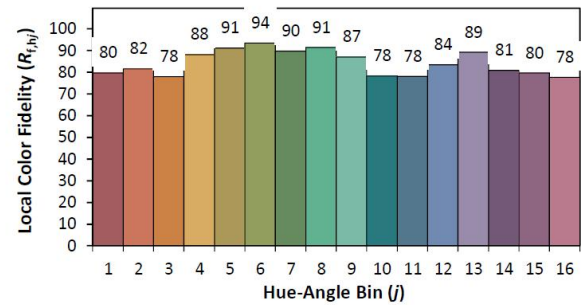
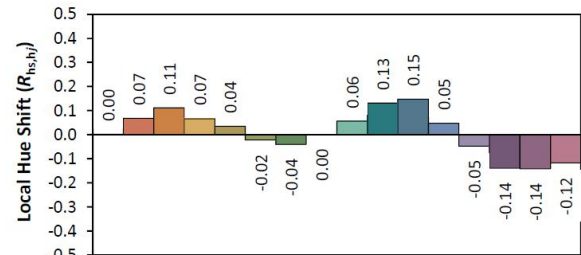
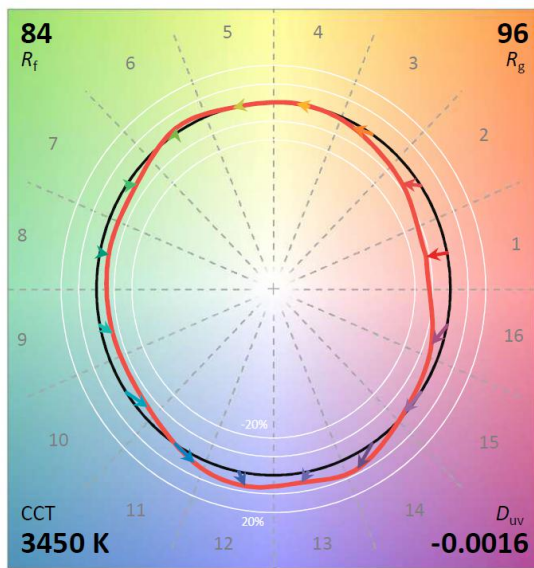
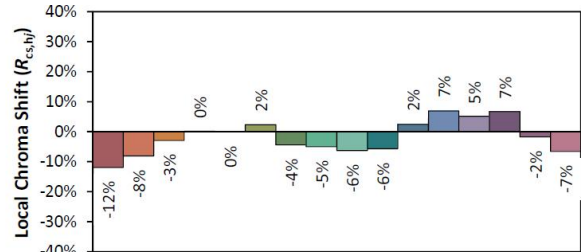
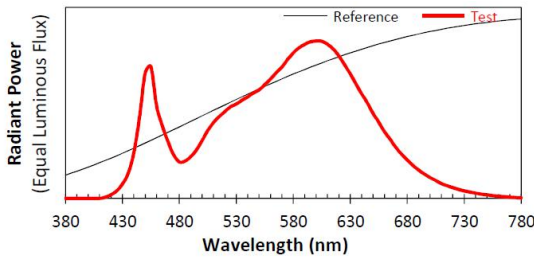
### ANSI/IES TM-30-18 Color Rendition Report

Source: BL230911001-9

Manufacturer: RZ Lighting Co Ltd

Date: 2023-10-18

Model: PL1X4-40W-A5C5-P-[Blank;M;I;B;E] , 3500K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.4065  
 $y$  0.3877  
 $u'$  0.2377  
 $v'$  0.5102

|                     |    |
|---------------------|----|
| CIE 13.3-1995 (CRI) |    |
| $R_a$               | 83 |
| $R_g$               | 9  |

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



### 3.1.3 Model Number: PL1X4-40W-A5C5-P-[Blank;M;I;B;E] , 4000K

#### Electrical data

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.06           | 60             | 0.337             | 40.19     | 0.994        |

#### Photometric data

| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 5192.03            | 129.2           | 3900    |

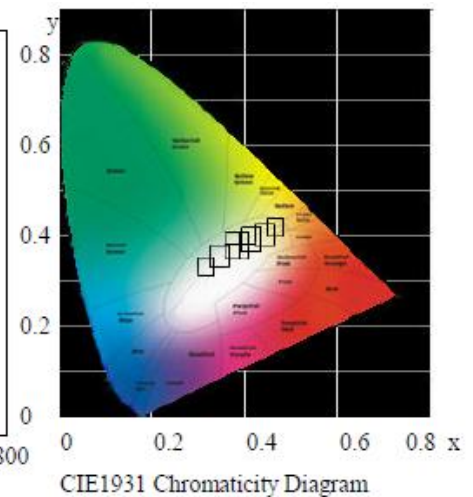
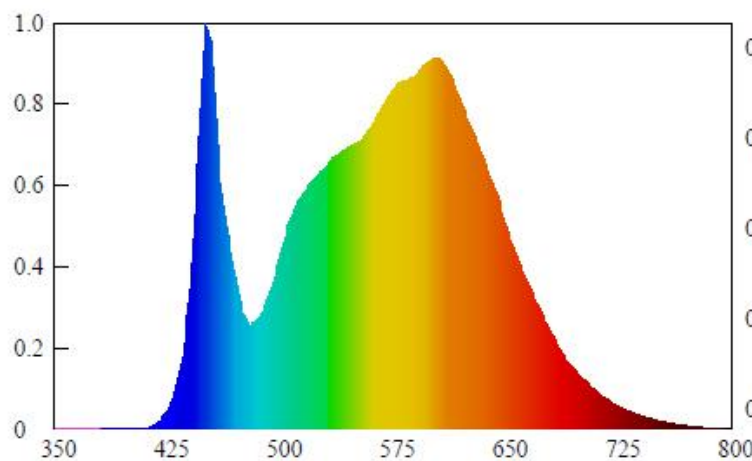
#### Chromaticity Coordinate

| Duv      | x      | y      | u'     | v'     |
|----------|--------|--------|--------|--------|
| -0.00028 | 0.3847 | 0.3788 | 0.2271 | 0.5031 |

#### Color Rendering

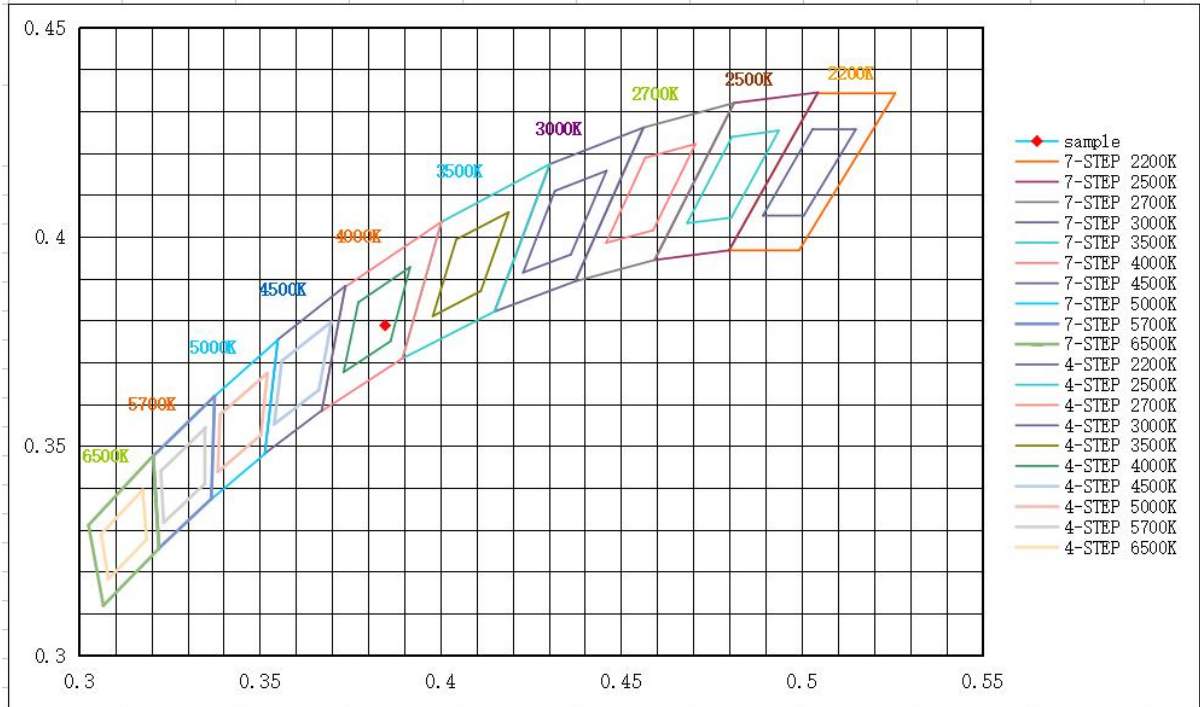
| CRI  | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 85.9 | 22 | 86 | 97 | -10       |

#### Spectral Distribution





### 7/4 Step Quadrangle

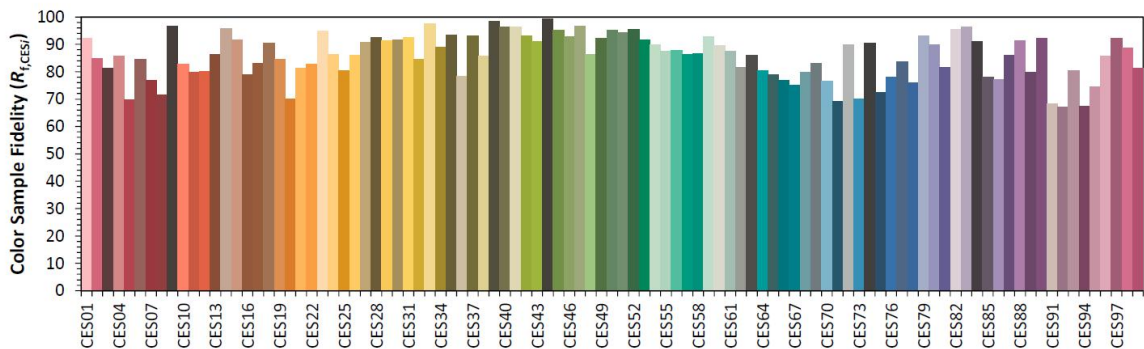
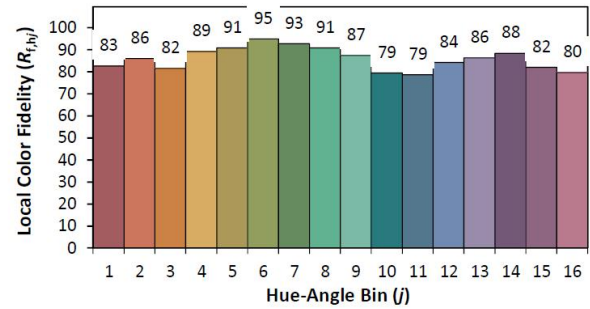
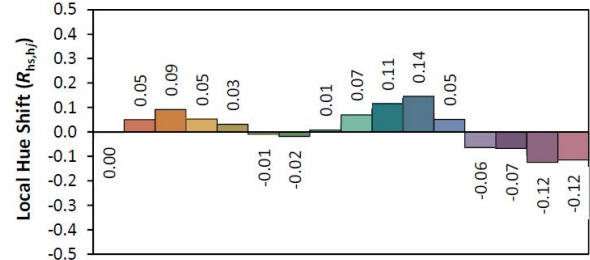
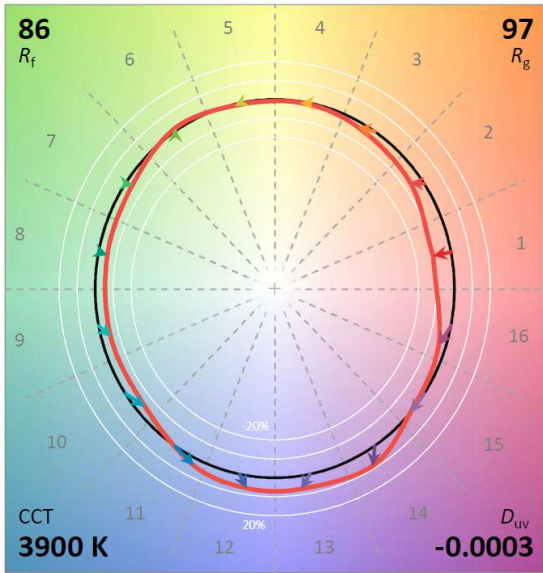
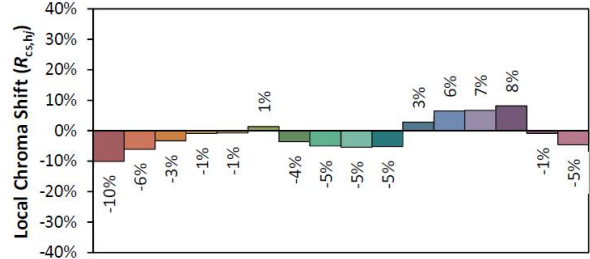
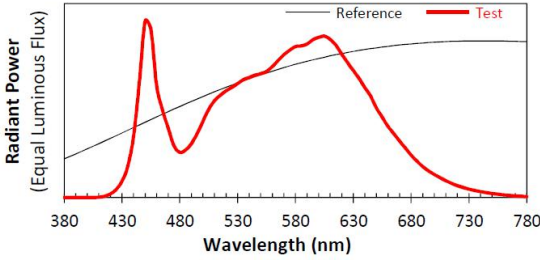




### ANSI/IES TM-30-18 Color Rendition Report

**Source:** BL230911001-9  
**Date:** 2023-10-18

**Manufacturer:** RZ Lighting Co Ltd  
**Model:** PL1X4-40W-A5C5-P-[Blank;M;I;B;E] , 4000K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3847  
 $y$  0.3788  
 $u'$  0.2271  
 $v'$  0.5031

|                     |    |
|---------------------|----|
| CIE 13.3-1995 (CRI) |    |
| $R_a$               | 86 |
| $R_g$               | 22 |

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



### 3.1.4 Model Number: PL1X4-40W-A5C5-P-[Blank;M;I;B;E] , 5000K

#### Electrical data

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.07           | 60             | 0.335             | 40.06     | 0.995        |

#### Photometric data

| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 5223.21            | 130.4           | 4976    |

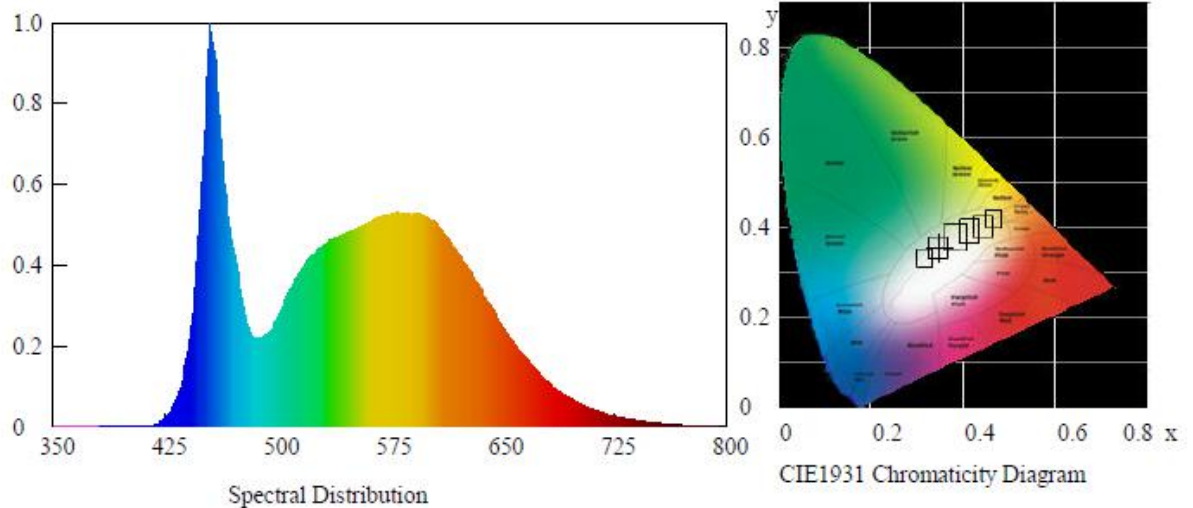
#### Chromaticity Coordinate

| Duv      | x      | y      | u'     | v'     |
|----------|--------|--------|--------|--------|
| +0.00006 | 0.3458 | 0.3523 | 0.2116 | 0.4851 |

#### Color Rendering

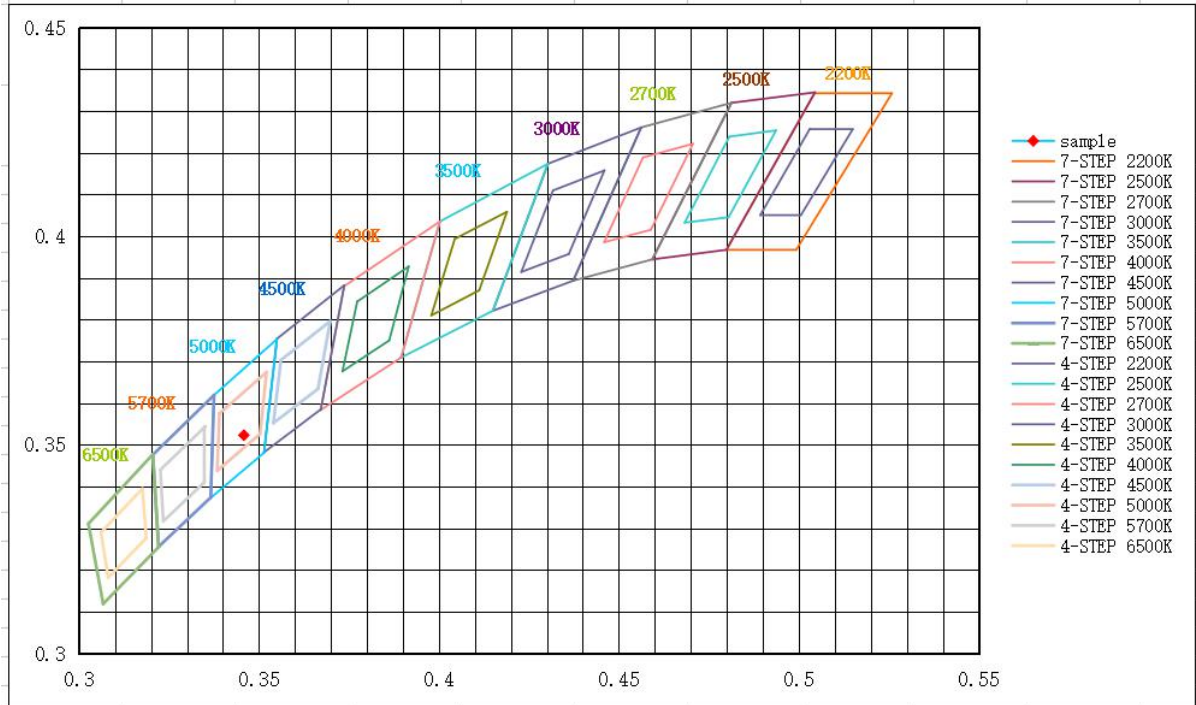
| CRI  | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 83.9 | 18 | 82 | 94 | -12       |

#### Spectral Distribution





### 7/4 Step Quadrangle







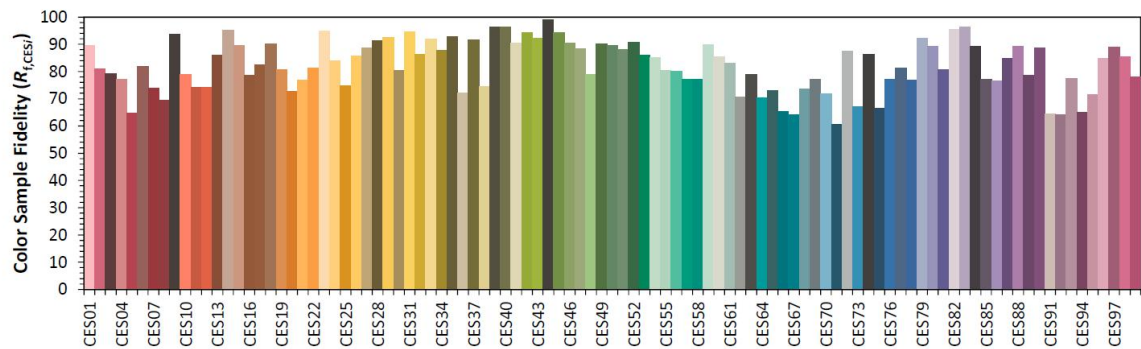
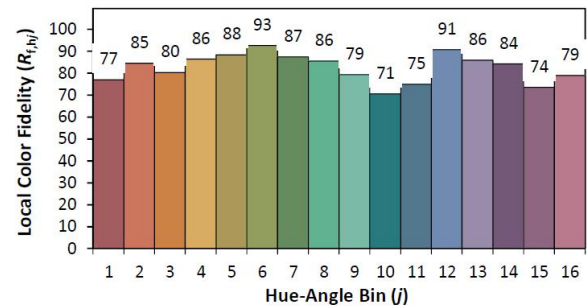
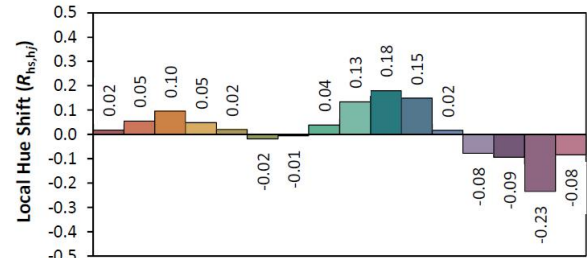
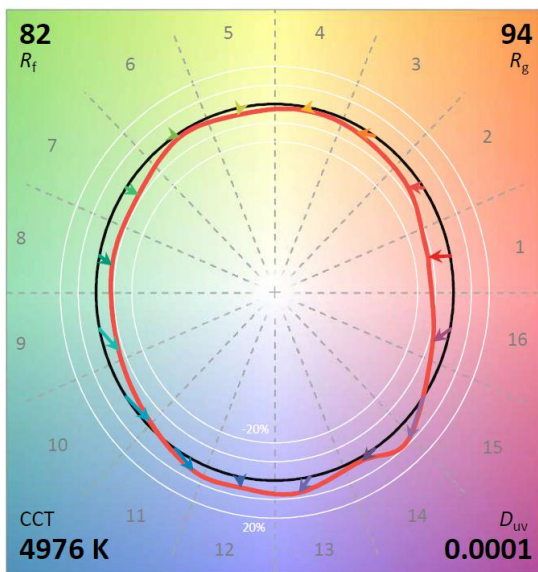
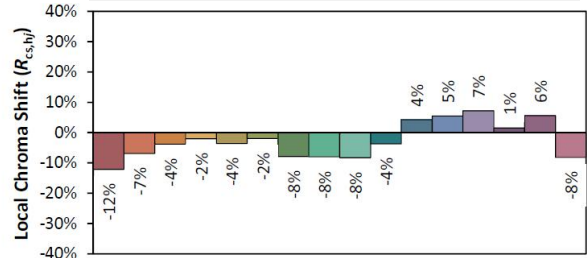
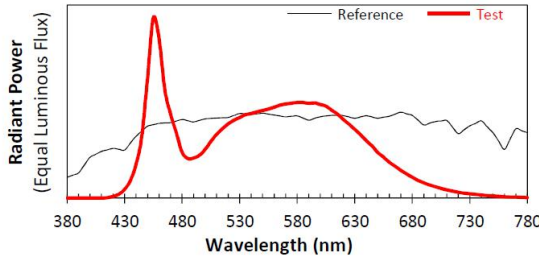
### ANSI/IES TM-30-18 Color Rendition Report

Source: BL230911001-9

Manufacturer: RZ Lighting Co Ltd

Date: 2023-10-18

Model: PL1X4-40W-A5C5-P-[Blank;M;l;B;E] , 5000K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

$x$  0.3458  
 $y$  0.3523  
 $u'$  0.2116  
 $v'$  0.4851

|                     |    |
|---------------------|----|
| CIE 13.3-1995 (CRI) |    |
| $R_a$               | 84 |
| $R_g$               | 17 |

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



### 3.1.5 Model Number: PL1X4-40W-A5C5-P-[Blank;M;I;B;E] , 6500K

#### Electrical data

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.08           | 60             | 0.336             | 40.14     | 0.995        |

#### Photometric data

| Luminous Flux (lm) | Efficacy (lm/W) | CCT (K) |
|--------------------|-----------------|---------|
| 5113.55            | 127.4           | 6612    |

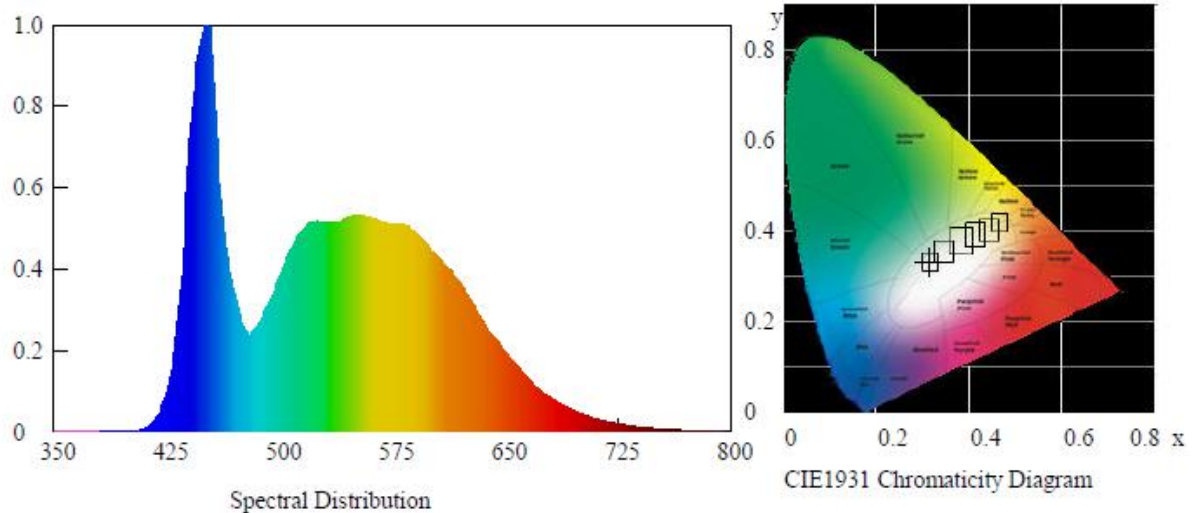
#### Chromaticity Coordinate

| Duv      | x      | y      | u'     | v'     |
|----------|--------|--------|--------|--------|
| +0.00465 | 0.3107 | 0.3298 | 0.1961 | 0.4685 |

#### Color Rendering

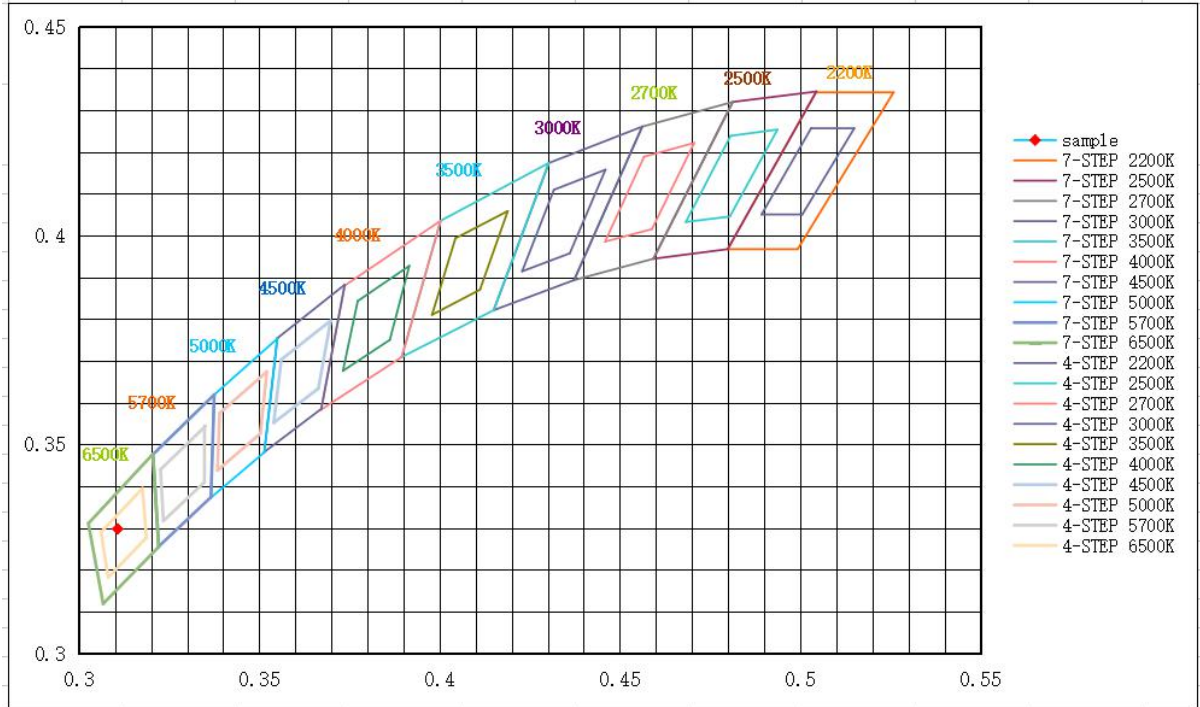
| CRI  | R9 | Rf | Rg | Rcs,h1(%) |
|------|----|----|----|-----------|
| 82.4 | 4  | 83 | 95 | -13       |

#### Spectral Distribution





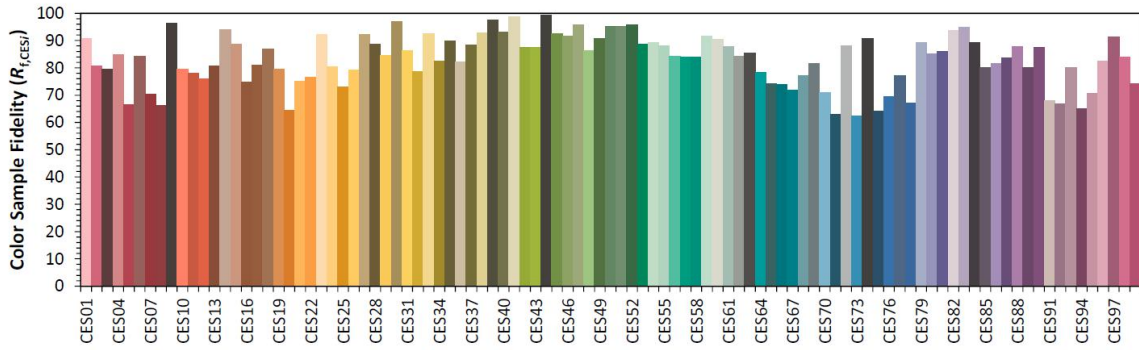
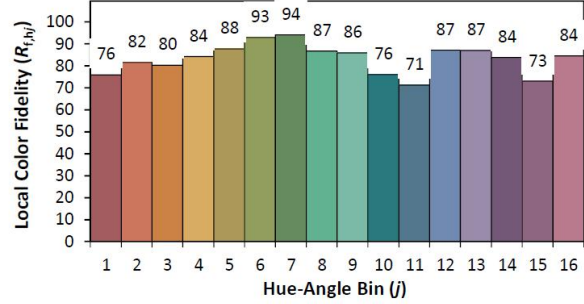
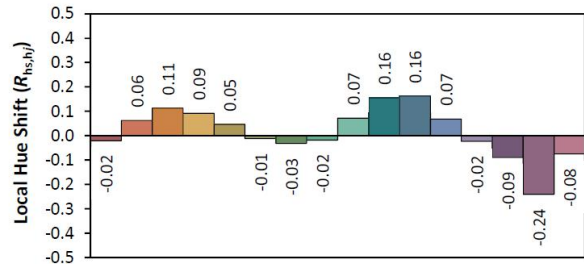
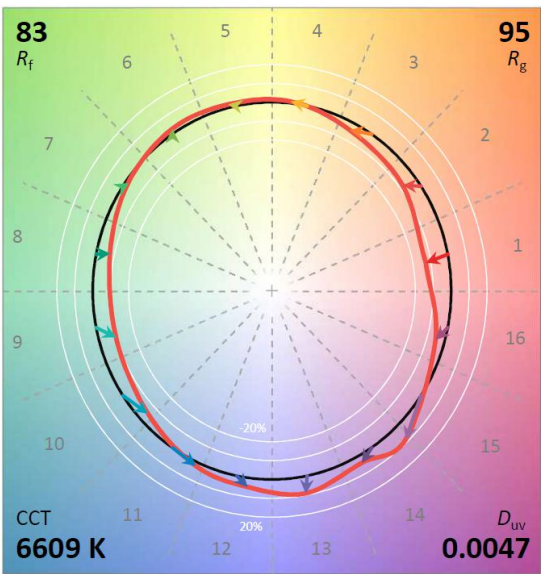
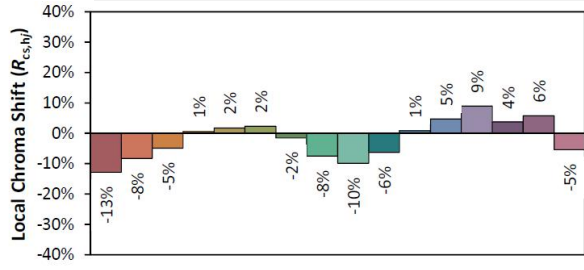
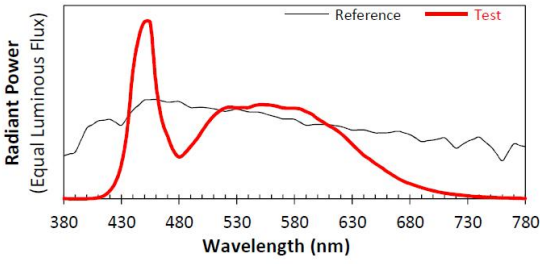
### 7/4 Step Quadrangle





### ANSI/IES TM-30-18 Color Rendition Report

Source: BL230911001-9      Manufacturer: RZ Lighting Co Ltd  
 Date: 2023-10-18      Model: PL1X4-40W-A5C5-P-[Blank;M;l;B;E] , 6500K



Notes: This is a recommended method for displaying ANSI/IES TM-30-18 information.

|      |        |   |
|------|--------|---|
| $x$  | 0.3106 | CIE 13.3-1995<br>(CRI)<br>$R_a$ 82<br>$R_g$ 4 |
| $y$  | 0.3298 |   |
| $u'$ | 0.1961 |   |
| $v'$ | 0.4685 |   |

Colors are for visual orientation purposes only. Created with the ANSI/IES TM-30-18 Calculator Version 2.00.



### 3.2 Goniophotometer System (Total operating time for luminous intensity distribution: 1.0 hour)

#### 3.2.1 Model Number: PL1X4-40W-A5C5-P-[Blank;M;I;B;E] , 3000K

##### Electrical data

| Input Voltage(V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|------------------|----------------|-------------------|-----------|--------------|
| 120.04           | 60             | 0.3360            | 40.11     | 0.9948       |

##### Photometric data

| Luminous Flux (lm) | Efficacy (lm/W) | S/MH (C0/180) | S/MH (C90/270) | Zonal Lumen in 0-60°(%lm) |
|--------------------|-----------------|---------------|----------------|---------------------------|
| 5032.44            | 125.47          | 1.62          | 1.88           | 84.07                     |



## Zonal Flux Diagram

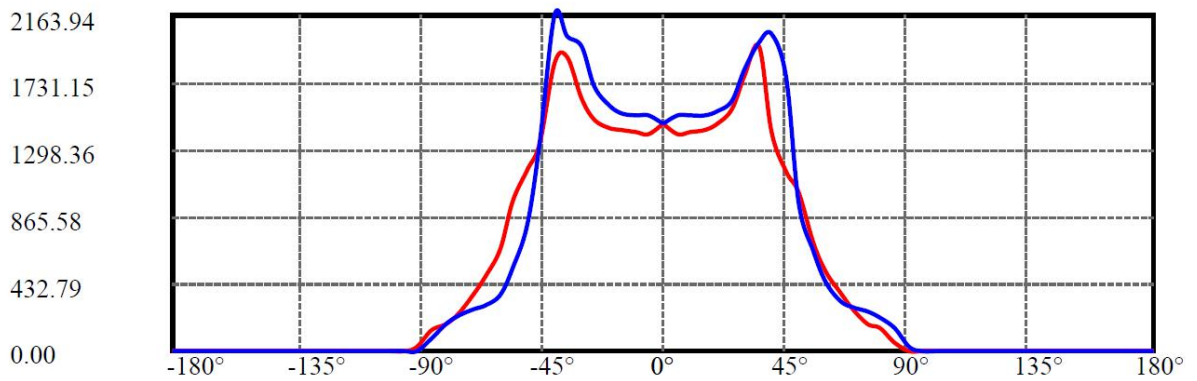
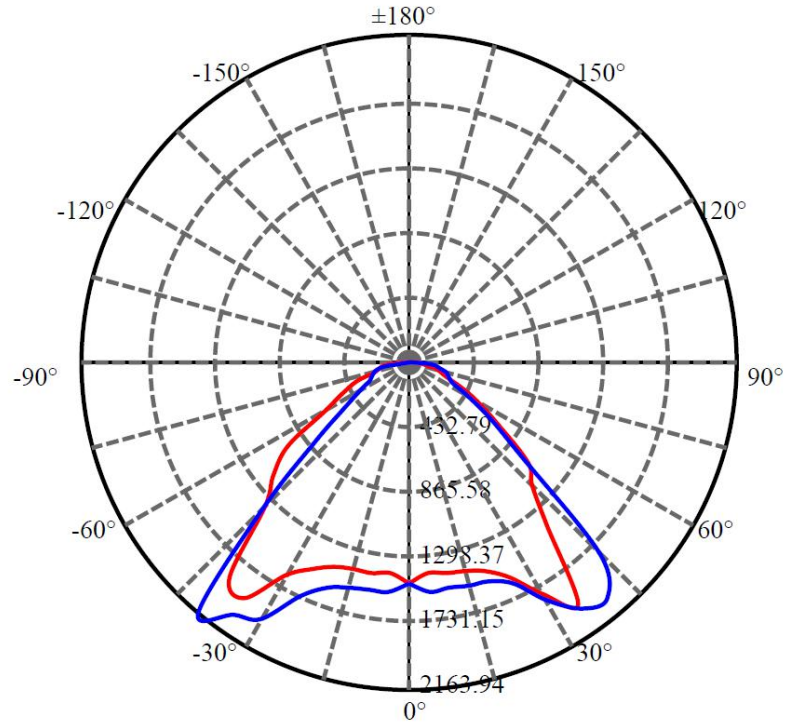
Zonal flux distribution table

| $\gamma(^{\circ})$ | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|--------------------|---------------|-------------|-----------|-------------|------------|
| 0.0                | 1464.228      | 0.000       | 0         | 0.00%       | 0.00%      |
| 5.0                | 1469.896      | 35.077      | 35.077    | 0.00%       | 0.70%      |
| 10.0               | 1475.653      | 105.372     | 140.448   | 0.00%       | 2.79%      |
| 15.0               | 1486.739      | 175.727     | 316.175   | 0.00%       | 6.28%      |
| 20.0               | 1518.421      | 247.667     | 563.843   | 0.00%       | 11.20%     |
| 25.0               | 1606.166      | 327.712     | 891.554   | 0.00%       | 17.72%     |
| 30.0               | 1817.814      | 433.307     | 1324.862  | 0.00%       | 26.33%     |
| 35.0               | 2000.018      | 562.202     | 1887.064  | 0.00%       | 37.50%     |
| 40.0               | 1793.892      | 632.985     | 2520.049  | 0.00%       | 50.08%     |
| 45.0               | 1360.479      | 584.058     | 3104.107  | 0.00%       | 61.68%     |
| 50.0               | 988.565       | 474.659     | 3578.766  | 0.00%       | 71.11%     |
| 55.0               | 707.295       | 368.737     | 3947.502  | 0.00%       | 78.44%     |
| 60.0               | 518.780       | 283.404     | 4230.906  | 0.00%       | 84.07%     |
| 65.0               | 399.844       | 223.319     | 4454.225  | 0.00%       | 88.51%     |
| 70.0               | 327.471       | 184.161     | 4638.386  | 0.00%       | 92.17%     |
| 75.0               | 254.246       | 152.052     | 4790.438  | 0.00%       | 95.19%     |
| 80.0               | 182.460       | 116.851     | 4907.288  | 0.00%       | 97.51%     |
| 85.0               | 99.588        | 76.639      | 4983.928  | 0.00%       | 99.04%     |
| 90.0               | 14.690        | 31.290      | 5015.218  | 0.00%       | 99.66%     |
| 95.0               | 1.205         | 4.352       | 5019.57   | 0.00%       | 99.74%     |
| 100.0              | 1.173         | 0.646       | 5020.216  | 0.00%       | 99.76%     |
| 105.0              | 1.279         | 0.656       | 5020.872  | 0.00%       | 99.77%     |
| 110.0              | 1.461         | 0.716       | 5021.588  | 0.00%       | 99.78%     |
| 115.0              | 1.652         | 0.788       | 5022.376  | 0.00%       | 99.80%     |
| 120.0              | 1.940         | 0.873       | 5023.25   | 0.00%       | 99.82%     |
| 125.0              | 2.324         | 0.986       | 5024.235  | 0.00%       | 99.84%     |
| 130.0              | 2.633         | 1.078       | 5025.313  | 0.00%       | 99.86%     |
| 135.0              | 2.878         | 1.114       | 5026.427  | 0.00%       | 99.88%     |
| 140.0              | 3.124         | 1.111       | 5027.538  | 0.00%       | 99.90%     |
| 145.0              | 3.305         | 1.072       | 5028.611  | 0.00%       | 99.92%     |
| 150.0              | 3.422         | 0.991       | 5029.601  | 0.00%       | 99.94%     |
| 155.0              | 3.475         | 0.873       | 5030.474  | 0.00%       | 99.96%     |
| 160.0              | 3.401         | 0.721       | 5031.195  | 0.00%       | 99.98%     |
| 165.0              | 3.273         | 0.550       | 5031.745  | 0.00%       | 99.99%     |
| 170.0              | 3.209         | 0.384       | 5032.13   | 0.00%       | 99.99%     |
| 175.0              | 3.209         | 0.230       | 5032.359  | 0.00%       | 100.00%    |
| 180.0              | 3.361         | 0.079       | 5032.438  | 0.00%       | 100.00%    |



### Luminous Intensity Distribution Diagram

Light Distribution Curve [Unit:cd]



C0/C180: —

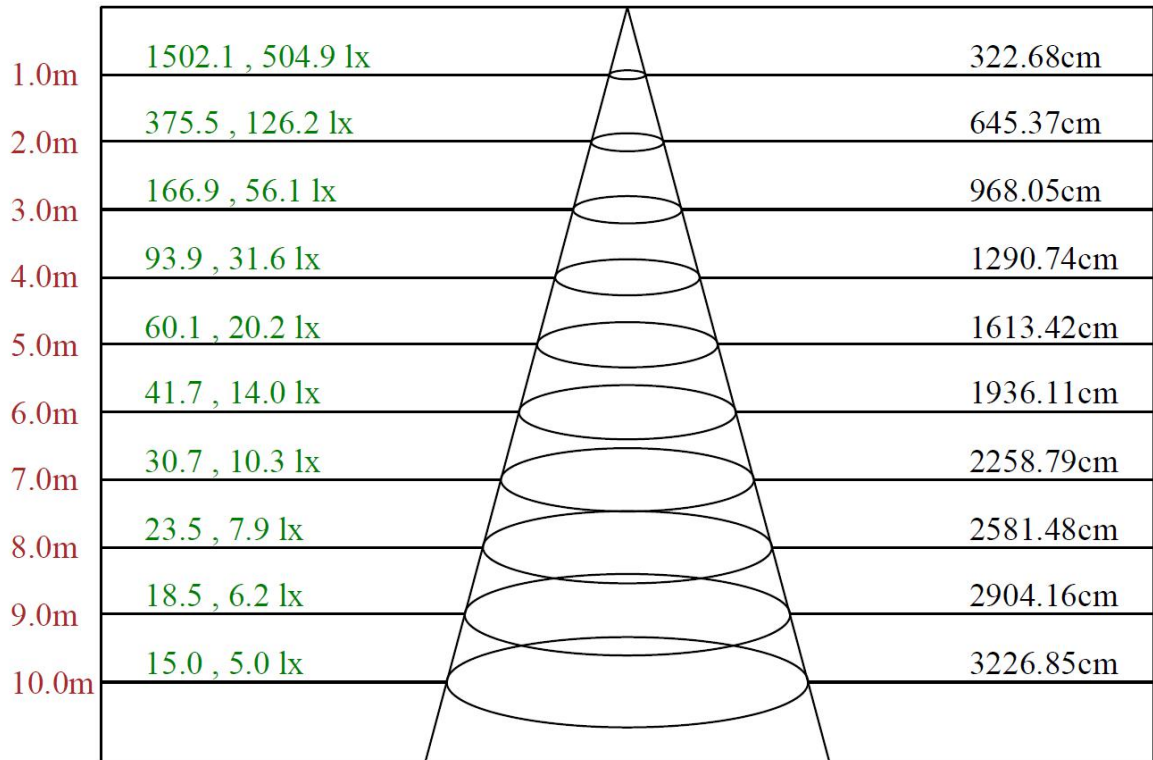
C90/C270: —

Field angle(10%Imax):C0/180Left:78.9 Right:74.1  
:C90/270Left:75.9 Right:79.3

Beam Angle(50%Imax):C0/180Left:54.9 Right:50.7  
:C90/270Left:47.6 Right:49.2



### Lux distance Curve



Max , Ave

Beam angle of C292.5 plane 116.42





**UGR Glare**

| Illumination assessment according UGR             |          |                  |       |       |       |          |                |       |       |       |       |
|---|----------|------------------|-------|-------|-------|----------|----------------|-------|-------|-------|-------|
| Rf of Ceiling                                     | 70       | 70               | 50    | 50    | 30    | 70       | 70             | 50    | 50    | 30    |       |
| Rf of Wall  | 50       | 30               | 50    | 30    | 30    | 50       | 30             | 50    | 30    | 30    |       |
| Rf of Floor                                       | 20       | 20               | 20    | 20    | 20    | 20       | 20             | 20    | 20    | 20    |       |
| Room dimensions                                   |          | Viewed crosswise |       |       |       |          | Viewed endwise |       |       |       |       |
| X   | Y        |                  |       |       |       |          |                |       |       |       |       |
| 2H  | 2H       | 12.72            | 14.28 | 13.09 | 14.60 | 14.92    | 15.64          | 17.20 | 16.01 | 17.52 | 17.84 |
|   | 3H       | 14.75            | 16.15 | 15.14 | 16.50 | 16.85    | 16.87          | 18.27 | 17.25 | 18.61 | 18.96 |
|   | 4H       | 15.54            | 16.85 | 15.94 | 17.21 | 17.58    | 17.54          | 18.86 | 17.94 | 19.22 | 19.59 |
|   | 6H       | 16.30            | 17.52 | 16.71 | 17.89 | 18.29    | 18.35          | 19.57 | 18.76 | 19.95 | 20.35 |
|   | 8H       | 16.56            | 17.74 | 16.98 | 18.12 | 18.53    | 18.76          | 19.94 | 19.18 | 20.32 | 20.73 |
| 4H  | 12H      | 16.68            | 17.81 | 17.10 | 18.20 | 18.62    | 19.16          | 20.29 | 19.58 | 20.68 | 21.10 |
|   | 2H       | 13.74            | 15.05 | 14.13 | 15.41 | 15.78    | 16.01          | 17.33 | 16.41 | 17.68 | 18.05 |
|   | 3H       | 15.90            | 17.01 | 16.32 | 17.41 | 17.82    | 17.56          | 18.67 | 17.98 | 19.06 | 19.48 |
|   | 4H       | 16.88            | 17.87 | 17.32 | 18.29 | 18.74    | 18.46          | 19.44 | 18.89 | 19.86 | 20.31 |
|   | 6H       | 17.69            | 18.58 | 18.16 | 19.02 | 19.47    | 19.39          | 20.27 | 19.86 | 20.72 | 21.17 |
| 8H  | 8H       | 18.02            | 18.84 | 18.49 | 19.29 | 19.76    | 19.89          | 20.72 | 20.37 | 21.17 | 21.64 |
|   | 12H      | 18.18            | 18.95 | 18.67 | 19.40 | 19.91    | 20.39          | 21.16 | 20.87 | 21.60 | 22.11 |
|   | 4H       | 17.37            | 18.19 | 17.84 | 18.64 | 19.11    | 18.72          | 19.55 | 19.20 | 20.00 | 20.47 |
|   | 6H       | 18.31            | 19.01 | 18.81 | 19.48 | 19.99    | 19.81          | 20.50 | 20.30 | 20.97 | 21.48 |
|   | 8H       | 18.75            | 19.36 | 19.27 | 19.87 | 20.37    | 20.43          | 21.04 | 20.95 | 21.56 | 22.05 |
| 12H   | 12H      | 18.98            | 19.50 | 19.50 | 20.01 | 20.52    | 21.01          | 21.53 | 21.54 | 22.05 | 22.56 |
|   | 4H       | 17.45            | 18.22 | 17.93 | 18.66 | 19.17    | 18.75          | 19.52 | 19.23 | 19.96 | 20.47 |
|   | 6H       | 18.49            | 19.10 | 19.00 | 19.61 | 20.11    | 19.91          | 20.52 | 20.42 | 21.03 | 21.52 |
|   | 8H       | 18.92            | 19.44 | 19.45 | 19.95 | 20.47    | 20.53          | 21.04 | 21.05 | 21.56 | 22.07 |
| Variation with the observer position at spacings: |          |                  |       |       |       |          |                |       |       |       |       |
| S = 1.0H  | 0.3/-0.8 |                  |       |       |       | 0.4/-0.8 |                |       |       |       |       |
| S = 1.5H  | 0.8/-1.3 |                  |       |       |       | 1.0/-1.1 |                |       |       |       |       |
| S = 2.0H  | 1.3/-1.3 |                  |       |       |       | 1.7/-1.0 |                |       |       |       |       |
| Standard tables:                                  | BK3      |                  |       |       |       | BK4      |                |       |       |       |       |
| Uncorrected UGR                                   | 2.1      |                  |       |       |       | 1.2      |                |       |       |       |       |

**Luminous Intensity Distribution Data**

|                 |         |         |         |         |         |         |         |         |         |
|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| C/ $\gamma$ (°) | 0.0     | 5.0     | 10.0    | 15.0    | 20.0    | 25.0    | 30.0    | 35.0    | 40.0    |
| 0.0             | 1464.23 | 1403.06 | 1415.68 | 1430.52 | 1467.02 | 1564.07 | 1769.94 | 1955.68 | 1411.24 |
| 22.5            | 1464.23 | 1429.84 | 1439.05 | 1448.94 | 1496.70 | 1587.44 | 1805.08 | 1758.00 | 1725.76 |
| 45.0            | 1464.23 | 1482.71 | 1485.78 | 1498.06 | 1540.02 | 1651.40 | 1904.51 | 1983.83 | 1507.95 |
| 67.5            | 1464.23 | 1478.45 | 1480.83 | 1489.19 | 1527.23 | 1636.90 | 1936.41 | 2028.00 | 1607.39 |
| 90.0            | 1464.23 | 1519.38 | 1518.19 | 1524.16 | 1545.82 | 1618.65 | 1811.90 | 1984.17 | 2037.55 |
| 112.5           | 1464.23 | 1518.53 | 1520.75 | 1526.20 | 1542.41 | 1604.15 | 1783.07 | 2116.69 | 1986.90 |
| 135.0           | 1464.23 | 1503.52 | 1506.93 | 1514.61 | 1534.39 | 1589.99 | 1753.22 | 2056.49 | 1965.92 |
| 157.5           | 1464.23 | 1443.14 | 1443.82 | 1455.08 | 1475.38 | 1534.22 | 1658.22 | 1900.93 | 1850.45 |
| 180.0           | 1464.23 | 1400.67 | 1412.78 | 1419.77 | 1439.05 | 1498.23 | 1624.28 | 1896.84 | 1851.47 |
| 202.5           | 1464.23 | 1415.34 | 1430.01 | 1444.50 | 1466.17 | 1532.17 | 1682.61 | 1953.81 | 1848.06 |
| 225.0           | 1464.23 | 1475.89 | 1475.89 | 1490.73 | 1513.07 | 1578.23 | 1754.42 | 2091.11 | 1897.86 |
| 247.5           | 1464.23 | 1474.01 | 1476.06 | 1482.54 | 1505.05 | 1573.28 | 1771.13 | 2109.19 | 1933.68 |
| 270.0           | 1464.23 | 1518.70 | 1523.30 | 1535.24 | 1581.13 | 1705.47 | 1965.40 | 2027.83 | 2163.60 |
| 292.5           | 1464.23 | 1518.70 | 1522.79 | 1533.54 | 1574.81 | 1699.50 | 2039.94 | 2163.94 | 1661.80 |
| 315.0           | 1464.23 | 1501.64 | 1510.68 | 1526.20 | 1571.23 | 1700.35 | 1974.44 | 2063.14 | 1590.51 |
| 337.5           | 1464.23 | 1434.78 | 1447.92 | 1468.55 | 1515.29 | 1624.62 | 1850.45 | 1910.65 | 1662.14 |
| 360.0           | 1464.23 | 1403.06 | 1415.68 | 1430.52 | 1467.02 | 1564.07 | 1769.94 | 1955.68 | 1411.24 |
| C/ $\gamma$ (°) | 45.0    | 50.0    | 55.0    | 60.0    | 65.0    | 70.0    | 75.0    | 80.0    | 85.0    |
| 0.0             | 1155.74 | 1024.75 | 698.46  | 505.04  | 376.78  | 266.42  | 180.29  | 146.69  | 48.61   |
| 22.5            | 1020.31 | 622.90  | 441.59  | 338.06  | 298.83  | 264.89  | 213.72  | 137.47  | 53.56   |
| 45.0            | 1186.44 | 829.45  | 627.50  | 500.60  | 398.44  | 323.73  | 239.47  | 151.63  | 57.82   |
| 67.5            | 1298.16 | 1092.63 | 782.03  | 569.17  | 430.33  | 325.61  | 245.27  | 180.63  | 77.27   |
| 90.0            | 1765.85 | 950.04  | 651.21  | 444.66  | 324.41  | 281.43  | 250.73  | 211.16  | 150.61  |
| 112.5           | 1493.63 | 1286.05 | 979.89  | 729.16  | 522.44  | 399.12  | 304.46  | 220.88  | 150.95  |
| 135.0           | 1449.45 | 1137.83 | 752.53  | 571.73  | 448.07  | 370.64  | 303.26  | 218.66  | 126.22  |
| 157.5           | 1580.78 | 931.28  | 602.94  | 434.94  | 347.61  | 316.05  | 276.65  | 201.95  | 129.12  |
| 180.0           | 1349.16 | 1167.34 | 972.55  | 656.50  | 487.13  | 362.45  | 244.76  | 181.14  | 137.99  |
| 202.5           | 1572.26 | 872.26  | 587.08  | 423.85  | 326.97  | 307.87  | 272.56  | 204.17  | 135.60  |
| 225.0           | 1389.75 | 1150.11 | 761.57  | 606.52  | 470.93  | 391.27  | 305.99  | 210.99  | 120.59  |
| 247.5           | 1471.62 | 1313.85 | 991.66  | 715.17  | 509.30  | 401.34  | 304.46  | 215.25  | 142.76  |
| 270.0           | 1361.27 | 813.42  | 543.42  | 363.81  | 292.18  | 262.50  | 226.85  | 168.35  | 86.65   |
| 292.5           | 1399.65 | 1195.14 | 865.61  | 602.26  | 459.16  | 346.24  | 248.17  | 176.53  | 67.71   |
| 315.0           | 1230.45 | 780.16  | 591.00  | 472.12  | 386.50  | 328.34  | 233.67  | 146.86  | 55.26   |
| 337.5           | 1043.17 | 649.85  | 467.69  | 366.88  | 318.44  | 291.66  | 217.64  | 147.03  | 52.70   |
| 360.0           | 1155.74 | 1024.75 | 698.46  | 505.04  | 376.78  | 266.42  | 180.29  | 146.69  | 48.61   |
| C/ $\gamma$ (°) | 90.0    | 95.0    | 100.0   | 105.0   | 110.0   | 115.0   | 120.0   | 125.0   | 130.0   |
| 0.0             | 1.71    | 1.37    | 1.37    | 1.19    | 1.37    | 1.54    | 1.71    | 2.22    | 2.39    |
| 22.5            | 1.71    | 1.37    | 1.19    | 1.19    | 1.37    | 1.71    | 2.05    | 2.39    | 2.73    |
| 45.0            | 1.88    | 1.37    | 1.19    | 1.37    | 1.88    | 1.88    | 2.39    | 2.56    | 2.90    |
| 67.5            | 1.54    | 1.19    | 1.37    | 1.54    | 1.88    | 2.05    | 2.39    | 2.73    | 2.90    |
| 90.0            | 23.37   | 1.02    | 1.19    | 1.37    | 1.71    | 1.88    | 2.22    | 2.39    | 2.90    |
| 112.5           | 27.46   | 0.85    | 1.02    | 1.02    | 1.54    | 1.54    | 1.88    | 2.56    | 2.73    |
| 135.0           | 32.24   | 1.19    | 0.85    | 1.02    | 1.37    | 1.37    | 1.88    | 2.22    | 2.39    |
| 157.5           | 31.04   | 1.02    | 0.85    | 1.19    | 0.85    | 1.19    | 1.54    | 2.05    | 2.56    |
| 180.0           | 29.34   | 0.85    | 1.02    | 1.02    | 1.02    | 1.19    | 1.37    | 2.05    | 2.22    |
| 202.5           | 32.41   | 0.85    | 1.02    | 1.19    | 1.02    | 1.19    | 1.19    | 1.88    | 2.05    |
| 225.0           | 26.44   | 1.19    | 1.02    | 1.02    | 1.37    | 1.54    | 1.71    | 2.05    | 2.39    |
| 247.5           | 18.76   | 1.02    | 1.02    | 1.19    | 1.19    | 1.54    | 1.88    | 1.88    | 2.39    |
| 270.0           | 1.71    | 1.71    | 1.37    | 1.71    | 1.88    | 2.39    | 2.56    | 3.24    | 3.41    |
| 292.5           | 1.71    | 1.54    | 1.54    | 1.54    | 1.88    | 2.05    | 2.22    | 2.56    | 3.07    |
| 315.0           | 2.05    | 1.37    | 1.37    | 1.37    | 1.71    | 1.71    | 2.05    | 2.39    | 2.73    |
| 337.5           | 1.71    | 1.37    | 1.37    | 1.54    | 1.37    | 1.71    | 2.05    | 2.05    | 2.39    |
| 360.0           | 1.71    | 1.37    | 1.37    | 1.19    | 1.37    | 1.54    | 1.71    | 2.22    | 2.39    |



|               |              |              |              |              |              |              |              |              |              |
|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>C/γ(°)</b> | <b>135.0</b> | <b>140.0</b> | <b>145.0</b> | <b>150.0</b> | <b>155.0</b> | <b>160.0</b> | <b>165.0</b> | <b>170.0</b> | <b>175.0</b> |
| 0.0           | 2.73         | 3.07         | 3.07         | 3.24         | 3.24         | 3.24         | 2.73         | 2.90         | 3.24         |
| 22.5          | 2.90         | 3.07         | 3.24         | 3.07         | 3.24         | 3.24         | 3.24         | 3.24         | 3.24         |
| 45.0          | 3.07         | 3.24         | 3.41         | 3.41         | 3.41         | 3.41         | 3.24         | 3.24         | 3.24         |
| 67.5          | 3.24         | 3.41         | 3.41         | 3.58         | 3.58         | 3.58         | 3.58         | 3.07         | 3.41         |
| 90.0          | 3.07         | 3.41         | 3.75         | 3.75         | 3.75         | 3.58         | 3.41         | 3.24         | 3.24         |
| 112.5         | 3.07         | 3.24         | 3.41         | 3.58         | 3.58         | 3.58         | 3.24         | 3.41         | 3.07         |
| 135.0         | 2.73         | 3.07         | 3.41         | 3.24         | 3.41         | 3.41         | 3.41         | 3.41         | 3.24         |
| 157.5         | 2.73         | 2.90         | 3.07         | 3.24         | 3.24         | 3.07         | 3.24         | 3.07         | 3.07         |
| 180.0         | 2.39         | 2.73         | 2.73         | 3.07         | 3.24         | 3.07         | 2.90         | 3.07         | 2.90         |
| 202.5         | 2.56         | 2.73         | 2.73         | 3.24         | 3.24         | 3.07         | 3.07         | 3.07         | 2.90         |
| 225.0         | 2.56         | 2.73         | 2.90         | 3.24         | 3.41         | 3.41         | 3.24         | 3.24         | 3.07         |
| 247.5         | 2.56         | 2.90         | 3.24         | 3.24         | 3.58         | 3.41         | 3.24         | 3.24         | 3.24         |
| 270.0         | 3.58         | 3.75         | 3.92         | 4.26         | 3.92         | 4.09         | 3.75         | 3.58         | 3.75         |
| 292.5         | 3.24         | 3.58         | 3.75         | 3.58         | 3.75         | 3.58         | 3.41         | 3.24         | 3.24         |
| 315.0         | 2.90         | 3.24         | 3.41         | 3.58         | 3.58         | 3.24         | 3.41         | 3.07         | 3.24         |
| 337.5         | 2.73         | 2.90         | 3.41         | 3.41         | 3.41         | 3.41         | 3.24         | 3.24         | 3.24         |
| 360.0         | 2.73         | 3.07         | 3.07         | 3.24         | 3.24         | 3.24         | 2.73         | 2.90         | 3.24         |
| <b>C/γ(°)</b> | <b>180.0</b> |              |              |              |              |              |              |              |              |
| 0.0           | 3.36         |              |              |              |              |              |              |              |              |
| 22.5          | 3.36         |              |              |              |              |              |              |              |              |
| 45.0          | 3.36         |              |              |              |              |              |              |              |              |
| 67.5          | 3.36         |              |              |              |              |              |              |              |              |
| 90.0          | 3.36         |              |              |              |              |              |              |              |              |
| 112.5         | 3.36         |              |              |              |              |              |              |              |              |
| 135.0         | 3.36         |              |              |              |              |              |              |              |              |
| 157.5         | 3.36         |              |              |              |              |              |              |              |              |
| 180.0         | 3.36         |              |              |              |              |              |              |              |              |
| 202.5         | 3.36         |              |              |              |              |              |              |              |              |
| 225.0         | 3.36         |              |              |              |              |              |              |              |              |
| 247.5         | 3.36         |              |              |              |              |              |              |              |              |
| 270.0         | 3.36         |              |              |              |              |              |              |              |              |
| 292.5         | 3.36         |              |              |              |              |              |              |              |              |
| 315.0         | 3.36         |              |              |              |              |              |              |              |              |
| 337.5         | 3.36         |              |              |              |              |              |              |              |              |
| 360.0         | 3.36         |              |              |              |              |              |              |              |              |



## 4 Additional Test

### Electrical data

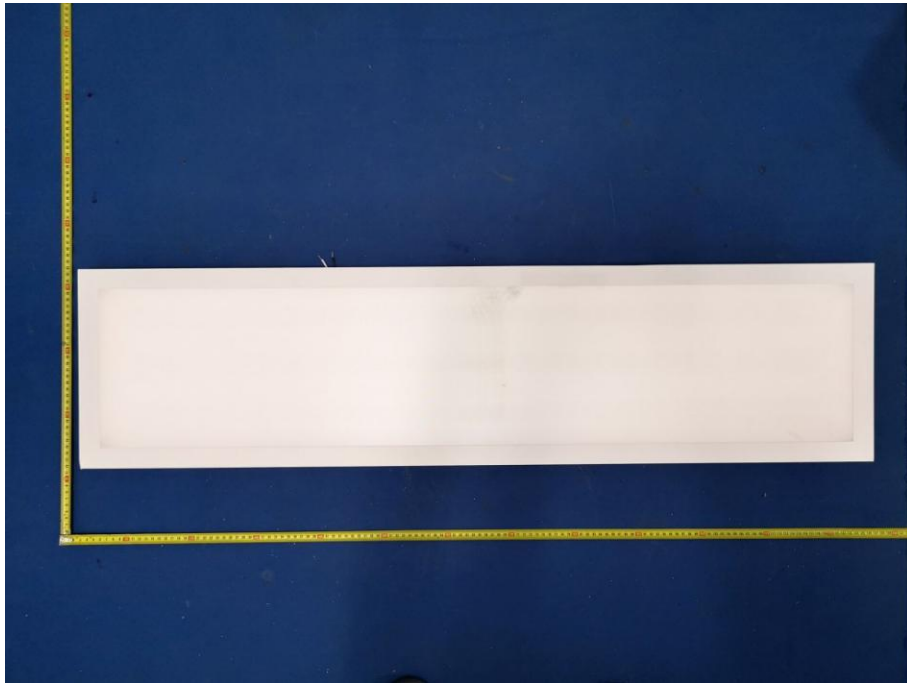
| Model Number                         | CCT(K) | Test Voltage (V) | Frequency (Hz) | Power Factor | THD(%) |
|--------------------------------------|--------|------------------|----------------|--------------|--------|
| PL1X4-40W-A5C5-P-[<br>Blank;M;I;B;E] | 3000   | 120              | 60             | 0.995        | 5.9    |
|                                      |        | 277              | 60             | 0.946        | 12.6   |
|                                      | 3500   | 277              | 60             | 0.946        | 12.3   |
|                                      | 4000   | 277              | 60             | 0.948        | 12.5   |
|                                      | 5000   | 277              | 60             | 0.947        | 12.1   |
|                                      | 6500   | 277              | 60             | 0.947        | 11.9   |

## 5 Data reporting for white-tunable submissions

| ANSI CCT Quadrangle (omit any outside product range) / Worst-Case Value | Actual CCT (K) | Power Consumption (W) | Lumen Output (lm) | Input Control Signal Applied |
|---|----------------|-----------------------|-------------------|------------------------------|
| 3000K   | 2973           | 40.17                 | 5045.97           | 0%                           |
| 3500K   | 3450           | 40.09                 | 5083.63           | 25%                          |
| 4000K   | 3900           | 40.19                 | 5192.03           | 50%                          |
| 5000K   | 4976           | 40.06                 | 5223.21           | 75%                          |
| 6500K   | 6612           | 40.14                 | 5113.55           | 100%                         |
| Lowest Efficacy   | 2973           | 40.17                 | 5045.97           | 0%                           |
| Maximum Power   | 3900           | 40.19                 | 5192.03           | 50%                          |



## Photo Document



\*\*\*\*End of test report\*\*\*\*