



NVLAP LAB CODE:201045-0



Shenzhen Anbotek Compliance Laboratory Limited

## IES LM-79-08 TEST REPORT

### For Beyond LED Technology

**Report Number:** R011508121L

**Product Type:** Vertical Refrigerated Case Luminaires-center\*\*

**Date of Receipt:** 2015-07-24

**Date of Test:** 2015-07-25 to 2015-08-06

**Date of Report:** 2015-08-07

**Product Model:** 101782

**Product Description:** AC100-277V 50/60Hz 25W 5000K

**Product Criteria:** IES LM-79-08: Electrical and Photometric Measurements of Solid-State Lighting Products

**Prepared By:** Shenzhen Anbotek Compliance Laboratory Limited, 1/F., Building 1,  
SEC Industrial Park, No.0409 Qianhai Road,Nanshan District,  
Shenzhen, Guangdong, China  
Tel: +86 755 2606 6544  
Fax: +86 755 26014772  
Web: www.anbotek.com

**Tested By:** Rain chen

**Reviewed By:** Vic zhou/Energy Lab Manager

Note: 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 Anbotek Compliance Laboratory Limited. This report must not be used by the customer to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

**TABLE OF CONTENTS**

|  |    |
|--|----|
| 1 – GENERAL.....   | 3  |
| 1.1 Product description.....                             | 3  |
| 1.2 Standard of method.....                              | 3  |
| 1.3 Test Facility.....                                   | 3  |
| 2 – Test Equipment List and Details.....                 | 4  |
| 3 – Test Method.....                                     | 5  |
| 3.1 Ambient Condition.....                               | 5  |
| 3.2 Power Supply Characteristics.....                    | 5  |
| 3.3 Seasoning and Stabilization.....                     | 5  |
| 3.4 Integrating Sphere System.....                       | 5  |
| 3.5 Goniophotometer System.....                          | 5  |
| 4 – Test Result.....                                     | 6  |
| 4.1 Photometric test with Integrating Sphere System..... | 6  |
| 4.2 Photometric test with Goniophotometer System.....    | 9  |
| 5 – Additional Test.....                                 | 14 |
| Attachment A – Product PHOTO.....                        | 15 |

## 1 – GENERAL

### 1.1 Product description

#### General Information

|                                 |   |
|---------------------------------|---|
| <b>Applicant</b>                | Beyond LED Technology                   |
| <b>Applicant Address</b>        | 1939 Parker Ct Stone Mountain, GA 30087 |
| <b>Manufacturer</b>             | Beyond LED Technology                   |
| <b>Manufacturer Address</b>     | 1939 Parker Ct Stone Mountain, GA 30087 |
| <b>Brand name</b>               | Beyond LED                              |
| <b>Test Model Number</b>        | 101782                                  |
| <b>Burning time before test</b> | 0 Hours (For new products)              |

#### Rated Values

|                     |                    |
|---------------------|--------------------|
| <b>Rated Inputs</b> | AC100-277V 50/60Hz |
| <b>Rated Power</b>  | 25W                |
| <b>Nominal CCT</b>  | 5000K              |

### 1.2 Standard of method

- ANSI C78.377-2011: Specifications for the Chromaticity of Solid State Lighting Products
- ANSI C82.77-2002: Harmonic Emission Limits-Related Power Quality Requirements for Lighting Equipment
- 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 Test Facility

The test facility used by Shenzhen Anbotek Compliance Laboratory Limited is located at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China.

## 2 – Test Equipment List and Details

| Device                            | Manufacture | Model No      | Serial No | Test Range                                 | Calibration date | Calibration due date |
|-----------------------------------|-------------|---------------|-----------|--|------------------|----------------------|
| Goniophotometric System           | SENSING     | GMS-3000      | -         | -  | 2015-03-16       | 2016-03-15           |
| AC Power Source                   | Ainuo       | AN97001W      | -         | 0-300V, 1000VA                             | 2015-03-16       | 2016-03-15           |
| Digital Power Meter               | YOKOGAWA    | WT310         |           | 0-600V/0-10A/0-100Hz                       | 2015-03-16       | 2016-03-15           |
| Temperature & Humidity meter      | XINIXI      | CTH-608       | -         | 0°C~50°C, 10% to 90%RH                     | 2015-03-16       | 2016-03-15           |
| Total Luminous Flux Standard Lamp | SENSING     | 220V/500W     | S135009   | 220V/500W                                  | 2015-03-16       | 2016-03-15           |
| Total Luminous Flux Standard Lamp | SENSING     | 220V/500W     | S1350014  | 220V/500W                                  | 2015-03-16       | 2016-03-15           |
| 1.5m Integral Sphere              | SENSING     | SPR-600M      | -         | 380nm-780nm,0.011m~6.00×10 <sup>5</sup> lm | 2015-03-16       | 2016-03-15           |
| Spectrum analyzer                 | SENSING     | SPR-3000      | -         | 380nm-780nm,0.011m~6.00×10 <sup>5</sup> lm | 2015-03-16       | 2016-03-15           |
| AC Power Source                   | ALL POWER   | APW-110N      | 997079    | 0-300V, 0-1000VA                           | 2015-07-15       | 2016-07-14           |
| Digital Power Meter               | YOKOGAWA    | WT210         | -         | 0-600V/0-10A/0-100Hz                       | 2015-03-16       | 2016-03-15           |
| DC Power Supply                   | Linkcolor   | Linkcolor     | -         | DC 30V, 5A                                 | 2015-03-16       | 2016-03-15           |
| Total Luminous Flux Standard Lamp | SENSING     | 110 V / 100 W | S13100190 | Refer specification                        | 2015-03-16       | 2016-03-15           |
| Total Luminous Flux Standard Lamp | SENSING     | 110 V / 100 W | S1310034  | Refer specification                        | 2015-03-16       | 2016-03-15           |
| Temperature & Humidity meter      | XINIXI      | CTH-608       | -         | 0°C~50°C, 10% to 90%RH                     | 2015-03-16       | 2016-03-15           |

Statement of Traceability: Shenzhen Anbotek Compliance Laboratory Limited attests that all calibration has been performed using suitable standards traceable to national primary standards and International System of Unit (SI).

### **3 – Test Method**

---

#### **3.1 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.

#### **3.2 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.

#### **3.3 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).

#### **3.4 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.

#### **3.5 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.

## 4 – Test Result

### 4.1 Photometric test with Integrating Sphere System

#### Electrical data

| Input Voltage (V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|-------------------|----------------|-------------------|-----------|--------------|
| 119.9             | 60             | 0.197             | 23.37     | 0.989        |

#### Photometric data

| Luminous Flux (lm) | Radiant Flux (W) | Efficacy (lm/W) | CCT (K) | Duv    |
|--------------------|------------------|-----------------|---------|--------|
| 3130.52            | 9.7406           | 133.95          | 5100    | 0.0037 |

#### Chromaticity Coordinate

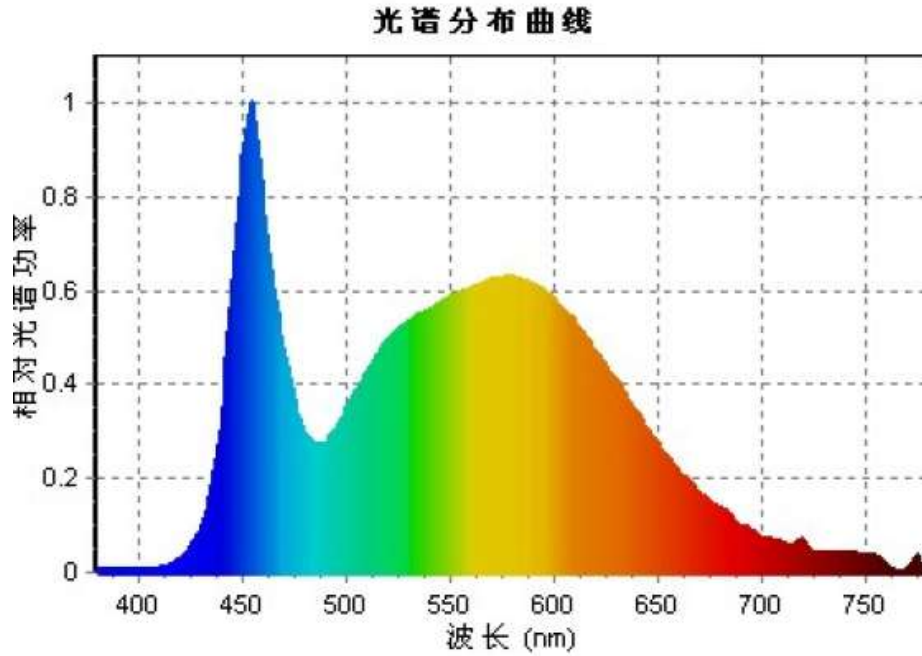
| x      | y      | u      | v      | u'     | v'     |
|--------|--------|--------|--------|--------|--------|
| 0.3430 | 0.3573 | 0.2078 | 0.3248 | 0.2078 | 0.4872 |

#### Color Rendering Details

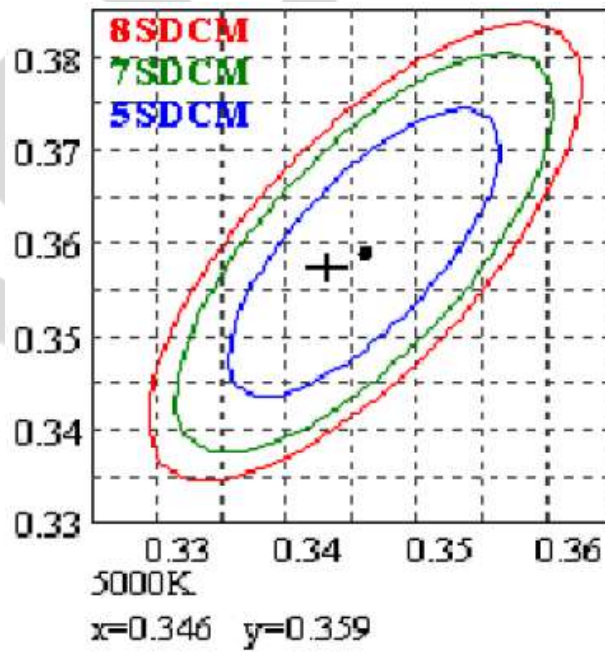
| Ra   |
|------|
| 83.2 |

| R1   | R2   | R3   | R4   | R5   |
|------|------|------|------|------|
| 81.8 | 86.2 | 87.4 | 84.9 | 80.3 |
| R6   | R7   | R8   | R9   | R10  |
| 78.0 | 92.3 | 74.0 | 15.4 | 64.0 |
| R11  | R12  | R13  | R14  | R15  |
| 82.7 | 46.7 | 82.6 | 92.4 | 79.1 |

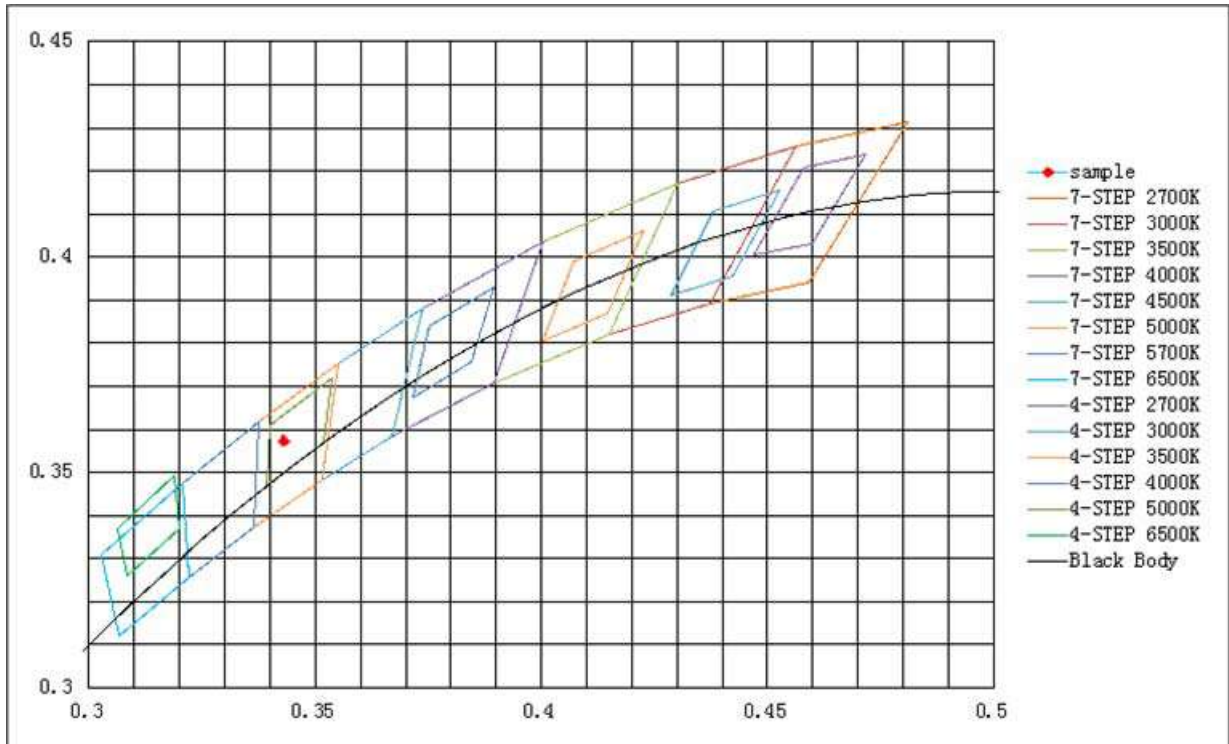
### Spectral Distribution



### Chromaticity Diagram (CIE 1931)



### ANSI Chromaticity Quadrangles Diagram





## 4.2 Photometric test with Goniophotometer System

### Electrical Measurement

| Input Voltage (V) | Frequency (Hz) | Input Current (A) | Power (W) | Power Factor |
|-------------------|----------------|-------------------|-----------|--------------|
| 119.95            | 60             | 0.194             | 23.03     | 0.992        |

### Photometric Measurement

| Luminous Flux (lm) | Efficacy (lm/W) | CBCP (cd) | Zonal Lumen Density(10~90° ) |
|--------------------|-----------------|-----------|------------------------------|
| 3144.89            | 136.56          | 927.214   | 92.481%                      |

**Zonal Lumen Summary**

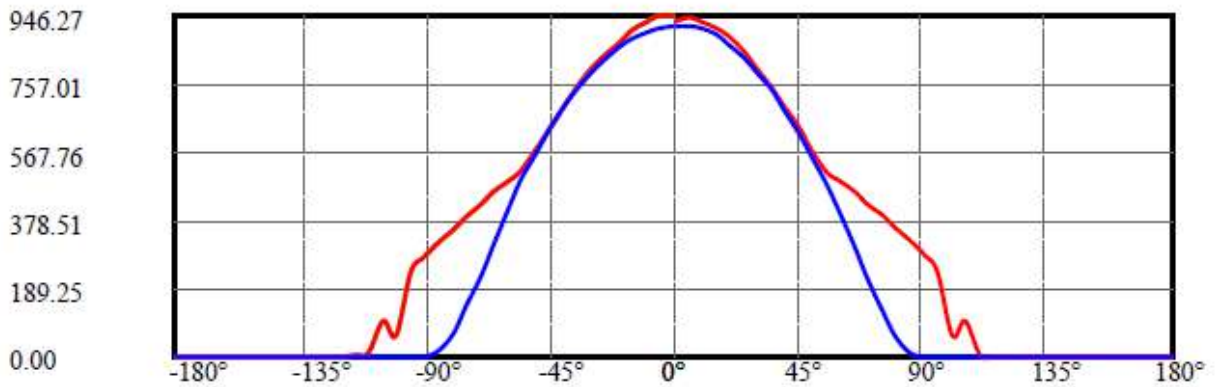
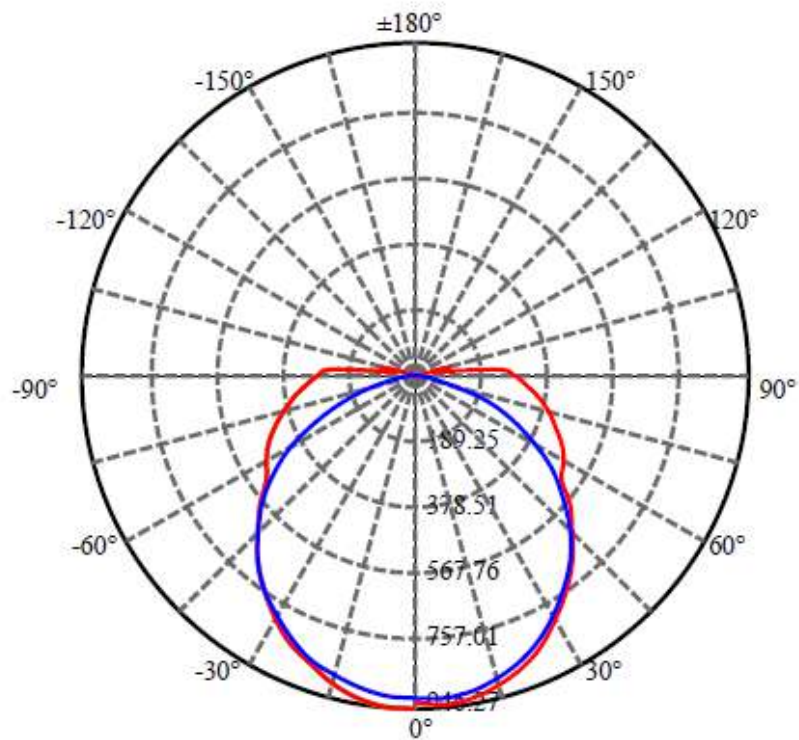
## ZONAL LUMEN SUMMARY

| Zone    | Lumens  | %Fixt   |
|---------|---------|---------|
| 0-30    | 722.23  | 22.97%  |
| 0-40    | 1184.13 | 37.65%  |
| 0-60    | 2111.12 | 67.13%  |
| 0-90    | 2996.34 | 95.28%  |
| 0-120   | 3139.76 | 99.84%  |
| 0-180   | 3144.89 | 100.00% |
| 60-90   | 1100.44 | 34.99%  |
| 90-120  | 241.47  | 7.68%   |
| 90-130  | 243.18  | 7.73%   |
| 90-150  | 245.47  | 7.81%   |
| 90-180  | 246.57  | 7.84%   |
| 0-70.85 | 2515.91 | 80.00%  |

## ZONAL LUMEN SUMMARY

|         |        |
|---------|--------|
| 0-10    | 87.90  |
| 10-20   | 251.95 |
| 20-30   | 382.38 |
| 30-40   | 461.91 |
| 40-50   | 481.97 |
| 50-60   | 445.02 |
| 60-70   | 377.85 |
| 70-80   | 294.17 |
| 80-90   | 213.20 |
| 90-100  | 115.56 |
| 100-110 | 24.99  |
| 110-120 | 2.87   |
| 120-130 | 1.71   |
| 130-140 | 1.32   |
| 140-150 | 0.96   |
| 150-160 | 0.64   |
| 160-170 | 0.37   |
| 170-180 | 0.09   |

**Light Distribution Curve [Unit: cd]**



C180(Max): ———

C0/C180: ———

C90/C270: ———

Field angle(10%Imax):C0/180Left:105.4 Right:105.5

:C90/270Left:78.2 Right:77.7

Beam Angle(50%Imax):C0/180Left:63.7 Right:63.9

:C90/270Left:57.1 Right:56.1

**Luminous Intensity (cd) Distribution Data**

|        |        |        |        |        |        |        |        |        |        |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| C/γ(°) | 0.0    | 5.0    | 10.0   | 15.0   | 20.0   | 25.0   | 30.0   | 35.0   | 40.0   |
| 0.0    | 927.21 | 940.63 | 928.87 | 910.48 | 885.47 | 848.19 | 797.67 | 749.29 | 693.13 |
| 22.5   | 923.90 | 920.42 | 908.00 | 887.79 | 863.93 | 831.46 | 784.58 | 732.56 | 678.89 |
| 45.0   | 924.07 | 921.75 | 910.81 | 892.76 | 865.42 | 832.12 | 794.68 | 738.19 | 678.22 |
| 67.5   | 917.77 | 916.78 | 907.17 | 887.45 | 860.45 | 825.17 | 780.77 | 731.73 | 675.57 |
| 90.0   | 918.93 | 918.27 | 910.65 | 894.74 | 863.43 | 829.80 | 787.56 | 738.36 | 681.70 |
| 112.5  | 929.04 | 927.21 | 921.91 | 904.85 | 878.18 | 836.10 | 788.72 | 735.71 | 675.24 |
| 135.0  | 931.02 | 930.03 | 920.75 | 900.05 | 870.89 | 830.63 | 786.07 | 739.68 | 688.83 |
| 157.5  | 936.99 | 934.50 | 922.24 | 896.07 | 864.59 | 828.64 | 793.19 | 743.66 | 684.19 |
| 180.0  | 946.27 | 943.45 | 929.04 | 904.35 | 872.21 | 834.61 | 796.84 | 746.31 | 691.81 |
| 202.5  | 923.90 | 923.73 | 909.82 | 886.46 | 855.15 | 817.21 | 780.77 | 735.21 | 679.22 |
| 225.0  | 924.07 | 920.59 | 908.99 | 885.80 | 855.15 | 819.37 | 774.31 | 728.75 | 683.36 |
| 247.5  | 917.77 | 913.13 | 900.54 | 882.65 | 856.81 | 825.17 | 784.41 | 732.23 | 681.04 |
| 270.0  | 918.93 | 912.80 | 901.04 | 879.17 | 858.46 | 825.50 | 786.90 | 741.67 | 692.14 |
| 292.5  | 929.04 | 920.42 | 905.02 | 884.97 | 859.95 | 828.15 | 786.40 | 743.83 | 692.64 |
| 315.0  | 931.02 | 923.24 | 906.01 | 886.46 | 859.79 | 824.50 | 788.39 | 738.03 | 679.22 |
| 337.5  | 936.99 | 932.18 | 918.93 | 896.07 | 870.06 | 836.76 | 789.55 | 735.54 | 684.35 |
| 360.0  | 927.21 | 940.63 | 928.87 | 910.48 | 885.47 | 848.19 | 797.67 | 749.29 | 693.13 |
| C/γ(°) | 45.0   | 50.0   | 55.0   | 60.0   | 65.0   | 70.0   | 75.0   | 80.0   | 85.0   |
| 0.0    | 634.98 | 571.70 | 511.23 | 484.89 | 457.39 | 425.92 | 393.28 | 356.84 | 323.37 |
| 22.5   | 619.91 | 561.10 | 493.84 | 455.90 | 424.26 | 390.80 | 356.34 | 320.89 | 287.59 |
| 45.0   | 621.73 | 554.47 | 491.85 | 424.59 | 371.75 | 330.50 | 291.90 | 253.13 | 220.17 |
| 67.5   | 620.41 | 555.96 | 477.27 | 399.41 | 326.69 | 250.65 | 182.73 | 131.87 | 95.75  |
| 90.0   | 618.25 | 549.67 | 477.27 | 397.42 | 304.65 | 218.51 | 130.71 | 58.98  | 12.42  |
| 112.5  | 613.28 | 544.04 | 480.59 | 405.87 | 334.31 | 260.09 | 190.68 | 134.02 | 92.77  |
| 135.0  | 618.92 | 557.29 | 497.82 | 427.41 | 369.92 | 329.34 | 290.90 | 248.16 | 211.72 |
| 157.5  | 631.01 | 576.17 | 503.61 | 468.83 | 435.36 | 401.40 | 362.64 | 323.87 | 288.25 |
| 180.0  | 629.35 | 573.52 | 514.88 | 486.22 | 455.90 | 423.43 | 388.98 | 350.54 | 316.08 |
| 202.5  | 623.22 | 569.55 | 498.64 | 460.05 | 429.89 | 396.27 | 360.48 | 324.20 | 288.92 |
| 225.0  | 626.37 | 559.11 | 501.30 | 434.53 | 373.73 | 331.49 | 289.74 | 249.32 | 209.23 |
| 247.5  | 618.75 | 550.83 | 483.07 | 408.52 | 330.99 | 265.06 | 192.50 | 136.51 | 91.61  |
| 270.0  | 627.53 | 562.92 | 495.50 | 411.01 | 314.43 | 225.30 | 138.49 | 64.61  | 17.73  |
| 292.5  | 639.95 | 572.86 | 498.64 | 418.46 | 341.43 | 262.91 | 194.16 | 147.11 | 104.53 |
| 315.0  | 623.72 | 562.42 | 498.98 | 431.39 | 382.35 | 342.26 | 304.49 | 261.58 | 227.45 |
| 337.5  | 626.20 | 566.40 | 497.82 | 460.05 | 430.72 | 401.07 | 365.12 | 331.82 | 299.52 |
| 360.0  | 634.98 | 571.70 | 511.23 | 484.89 | 457.39 | 425.92 | 393.28 | 356.84 | 323.37 |
| C/γ(°) | 90.0   | 95.0   | 100.0  | 105.0  | 110.0  | 115.0  | 120.0  | 125.0  | 130.0  |
| 0.0    | 282.95 | 235.74 | 59.80  | 101.22 | 8.78   | 2.82   | 2.15   | 1.99   | 1.82   |
| 22.5   | 253.63 | 207.58 | 44.73  | 52.18  | 6.96   | 3.31   | 2.65   | 2.32   | 2.15   |
| 45.0   | 187.86 | 54.50  | 46.55  | 6.30   | 3.15   | 2.65   | 2.48   | 2.15   | 2.32   |
| 67.5   | 78.69  | 6.63   | 2.65   | 2.15   | 2.15   | 2.15   | 1.82   | 1.66   | 1.49   |
| 90.0   | 0.83   | 0.83   | 0.66   | 0.83   | 0.83   | 0.99   | 0.99   | 0.99   | 1.16   |
| 112.5  | 74.38  | 67.26  | 3.48   | 2.15   | 1.99   | 2.32   | 2.15   | 1.82   | 1.66   |
| 135.0  | 182.89 | 62.79  | 41.08  | 7.29   | 3.48   | 2.65   | 2.48   | 1.99   | 2.32   |
| 157.5  | 251.14 | 211.72 | 49.86  | 63.28  | 7.79   | 3.48   | 2.65   | 2.15   | 1.99   |
| 180.0  | 279.14 | 237.73 | 59.47  | 99.40  | 11.76  | 3.15   | 2.15   | 1.99   | 1.82   |
| 202.5  | 252.80 | 214.86 | 50.69  | 64.77  | 6.46   | 3.15   | 2.15   | 2.15   | 1.99   |
| 225.0  | 181.90 | 139.98 | 29.32  | 6.46   | 2.98   | 2.32   | 1.99   | 1.99   | 1.99   |
| 247.5  | 76.20  | 8.45   | 2.98   | 1.99   | 1.66   | 1.99   | 1.82   | 1.49   | 1.16   |
| 270.0  | 1.99   | 0.66   | 0.50   | 0.66   | 0.83   | 0.83   | 0.83   | 0.99   | 0.99   |
| 292.5  | 84.65  | 16.90  | 3.98   | 2.15   | 1.99   | 2.15   | 1.99   | 1.82   | 1.66   |
| 315.0  | 191.51 | 146.45 | 24.68  | 6.79   | 3.31   | 2.48   | 2.32   | 2.15   | 2.48   |
| 337.5  | 261.91 | 216.69 | 49.70  | 64.94  | 7.45   | 3.48   | 2.48   | 2.15   | 1.99   |
| 360.0  | 282.95 | 235.74 | 59.80  | 101.22 | 8.78   | 2.82   | 2.15   | 1.99   | 1.82   |

| $C/\gamma(^{\circ})$ | 135.0 | 140.0 | 145.0 | 150.0 | 155.0 | 160.0 | 165.0 | 170.0 | 175.0 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 0.0                  | 1.66  | 1.82  | 1.82  | 1.49  | 1.49  | 1.33  | 1.33  | 1.33  | 1.33  |
| 22.5                 | 2.15  | 1.99  | 1.82  | 1.66  | 1.33  | 1.49  | 1.33  | 1.49  | 1.16  |
| 45.0                 | 2.15  | 1.82  | 1.66  | 1.49  | 1.49  | 1.33  | 1.33  | 1.33  | 1.16  |
| 67.5                 | 1.49  | 1.49  | 1.33  | 1.33  | 1.33  | 1.33  | 1.33  | 1.33  | 1.33  |
| 90.0                 | 1.16  | 1.16  | 1.33  | 1.33  | 1.49  | 1.49  | 1.33  | 1.33  | 1.33  |
| 112.5                | 1.49  | 1.49  | 1.49  | 1.33  | 1.33  | 1.33  | 1.33  | 1.33  | 1.33  |
| 135.0                | 2.15  | 1.66  | 1.49  | 1.49  | 1.33  | 1.33  | 1.33  | 1.33  | 1.33  |
| 157.5                | 1.82  | 1.99  | 1.82  | 1.49  | 1.33  | 1.33  | 1.33  | 1.33  | 1.16  |
| 180.0                | 1.66  | 1.82  | 1.66  | 1.66  | 1.49  | 1.49  | 1.33  | 1.33  | 1.33  |
| 202.5                | 1.66  | 1.82  | 1.66  | 1.49  | 1.33  | 1.16  | 1.33  | 1.33  | 1.33  |
| 225.0                | 1.82  | 1.49  | 1.33  | 1.33  | 1.33  | 1.33  | 1.16  | 1.33  | 1.16  |
| 247.5                | 1.16  | 1.16  | 1.16  | 1.33  | 1.33  | 1.33  | 1.16  | 1.33  | 1.33  |
| 270.0                | 0.99  | 1.16  | 1.16  | 1.33  | 1.16  | 1.33  | 1.33  | 1.33  | 1.33  |
| 292.5                | 1.49  | 1.49  | 1.33  | 1.33  | 1.33  | 1.16  | 1.33  | 1.33  | 1.33  |
| 315.0                | 2.15  | 1.99  | 1.66  | 1.49  | 1.49  | 1.33  | 1.33  | 1.16  | 1.16  |
| 337.5                | 1.99  | 1.99  | 1.66  | 1.49  | 1.33  | 1.33  | 1.33  | 1.33  | 1.16  |
| 360.0                | 1.66  | 1.82  | 1.82  | 1.49  | 1.49  | 1.33  | 1.33  | 1.33  | 1.33  |

| $C/\gamma(^{\circ})$ | 180.0 |
|----------------------|-------|
| 0.0                  | 1.33  |
| 22.5                 | 1.33  |
| 45.0                 | 1.49  |
| 67.5                 | 1.49  |
| 90.0                 | 1.33  |
| 112.5                | 1.16  |
| 135.0                | 1.33  |
| 157.5                | 1.33  |
| 180.0                | 1.33  |
| 202.5                | 1.33  |
| 225.0                | 1.49  |
| 247.5                | 1.49  |
| 270.0                | 1.33  |
| 292.5                | 1.16  |
| 315.0                | 1.33  |
| 337.5                | 1.33  |
| 360.0                | 1.33  |

## 5 – Additional Test

| Test item                 | Test Voltage (V) | Frequency(Hz) | Test Result |
|---------------------------|------------------|---------------|-------------|
| Power Factor              | 277              | 60            | 0.957       |
| Total harmonic Distortion | 277              | 60            | 17.43%      |
| Off State Power (W)       | 120              | 60            | 0           |

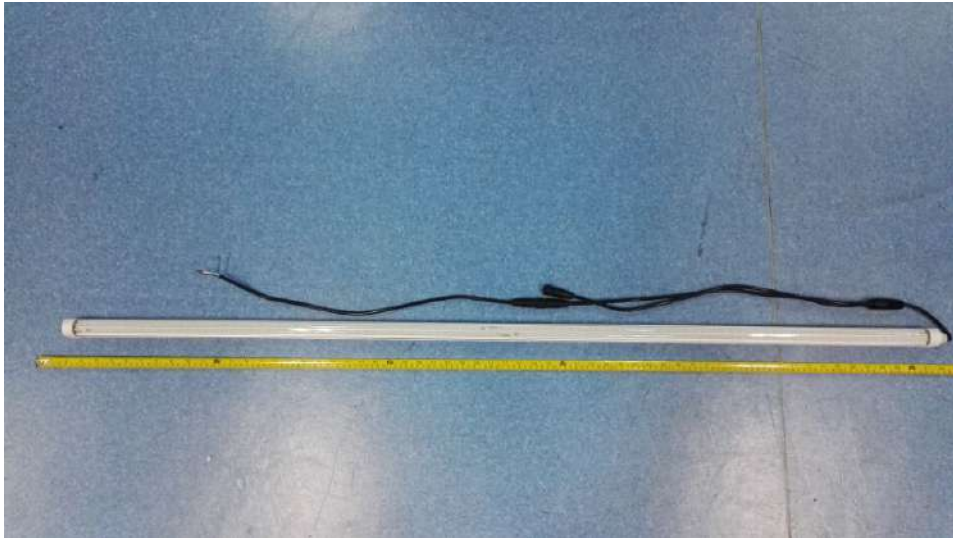
*The test data was only good for the test sample. It may have deviation for other test sample.*

---

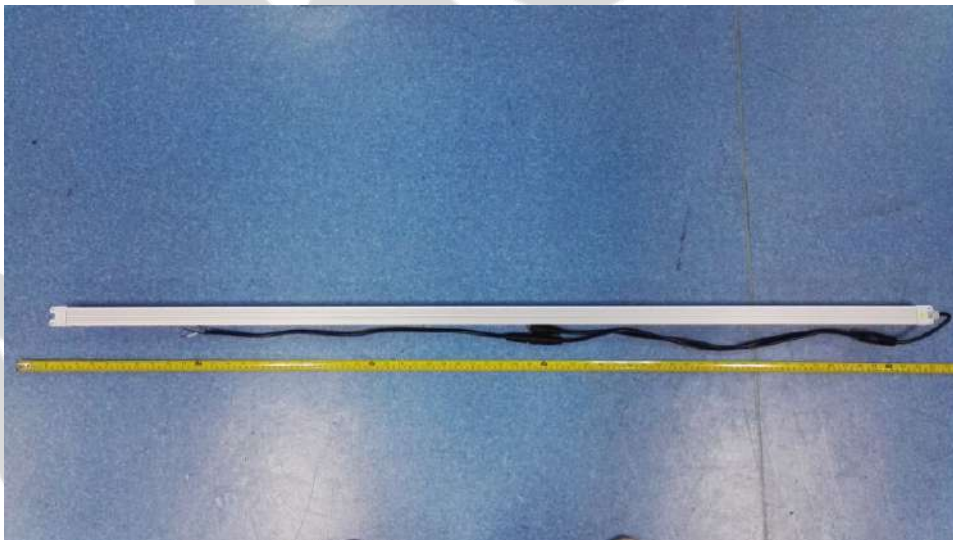
### Attachment A – Product PHOTO

---

#### FRONT PHOTO



#### REVERSE PHOTO



PHOTO

-----End of Report-----