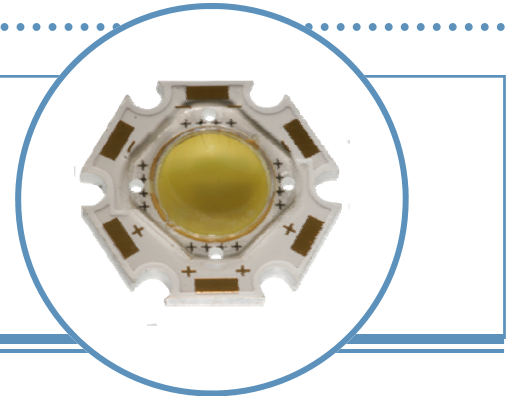


# Optimal XIV Star Series

## White, Multi-LED

### OV14Zxx-y

- 500+ Lumen High Output Series
- Multiple 1-watt chips in recessed cavity with an optical grade 8mm diameter lens - other lens designs possible
- Exceptional thermal resistance (1.8°C/W junction to heatsink)
- Solder Pads Au Plated



The OV14Zx-y Star Series is designed with high flux output and exceptional thermal resistance by recessing the multiple die into the metal core PCBoard.

#### Applications

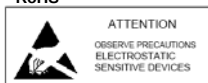
- Portable Flashlights
- Security / Garden Lighting
- Indoor /Outdoor Commercial Lighting
- Architectural Lighting
- Light Guides
- MR16 Lighting

| Part Number | Current Drive (mA) | Viewing Angle | Emitted CCT(K) | Total Luminous Flux (lm) |      | Forward Voltage (V <sub>F</sub> ) |
|-------------|--------------------|---------------|----------------|--------------------------|------|-----------------------------------|
|             | Max                | Typ.          | Typ.           | Min.                     | Typ. | Typ.                              |
| OV14ZW-1    | 700                | 120°          | 6500           | 300                      | 350  | 10.0                              |
| OV14ZW-2    | 1050               |               |                | 450                      | 510  |                                   |
| OV14ZW-3    | 1400               |               |                | 550                      | 650  |                                   |
| OV14ZWD-1   | 700                |               | 5400           | 300                      | 350  |                                   |
| OV14ZWD-2   | 1050               |               |                | 450                      | 510  |                                   |
| OV14ZWD-3   | 1400               |               |                | 550                      | 650  |                                   |
| OV14ZWW-1   | 700                |               | 3300           | 250                      | 300  |                                   |
| OV14ZWW-2   | 1050               |               |                | 400                      | 450  |                                   |
| OV14ZWW-3   | 1400               |               |                | 500                      | 550  |                                   |

| Color          | Minimum CCT (°K) | Maximum CCT (°K) |
|----------------|------------------|------------------|
| Cool White     | 6000             | 8000             |
| Daylight White | 4750             | 6000             |
| Warm White     | 2760             | 3800             |



RoHS



**DO NOT LOOK DIRECTLY  
AT LED WITH UNSHIELDED  
EYES OR DAMAGE TO  
RETINA MAY OCCUR.**

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

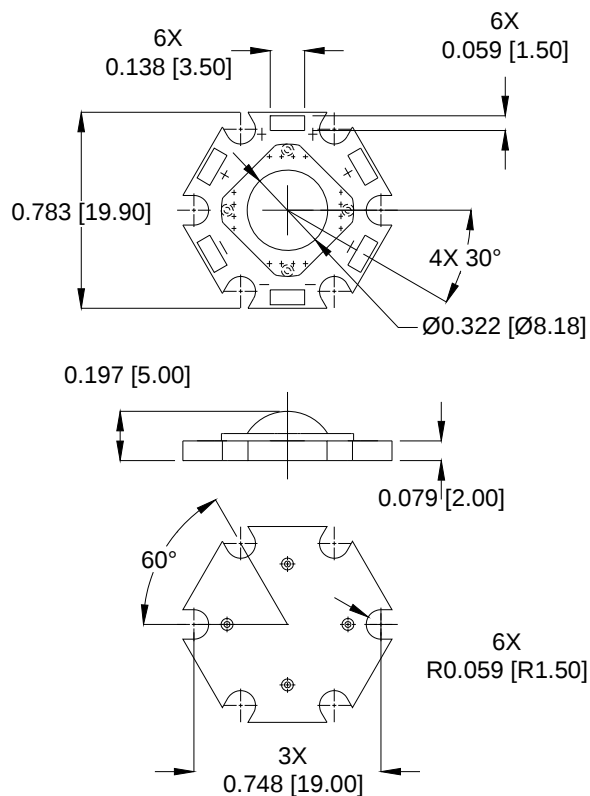
### Absolute Maximum Ratings

| Parameter                                  | Symbol           | Part Number       | MAX  | Unit |
|--------------------------------------------|------------------|-------------------|------|------|
| Average Forward Current <sup>[2][3]</sup>  | I <sub>F</sub>   | OV14Zxx-1         | 700  | mA   |
|                                            |                  | OV14Zxx-2         | 1050 |      |
|                                            |                  | OV14Zxx-3         | 1400 |      |
| Power Dissipation                          | P <sub>D</sub>   | OV14Zxx-1         | 7.9  | W    |
|                                            |                  | OV14Zxx-2         | 12   |      |
|                                            |                  | OV14Zxx-3         | 16   |      |
| Operating Temperature Range <sup>[3]</sup> | T <sub>opr</sub> | -40°C to 85°C     |      |      |
| Storage Temperature Range                  | T <sub>sto</sub> | -40°C to 100°C    |      |      |
| LED Junction Temperature <sup>2</sup>      | T <sub>j</sub>   | 125°C             |      |      |
| Terminal Soldering Condition               | T <sub>sol</sub> | 260°C / 5 seconds |      |      |

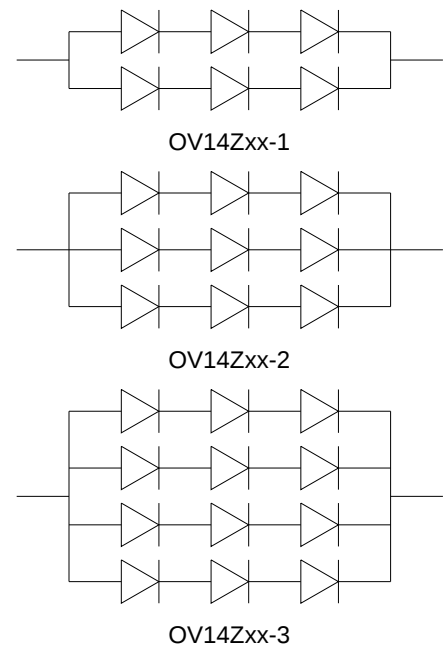
Notes:

1. Pulse width 1 ms maximum. Duty cycle 1/16
2. Design of Heat Dissipation should be considered.
3. The allowable operating current at different ambient temperatures - see Fig. 1
4. Thermal Resistance junction to Heatsink ( $T_{jhs}$ ) is <2° C/W

### Outline Drawings



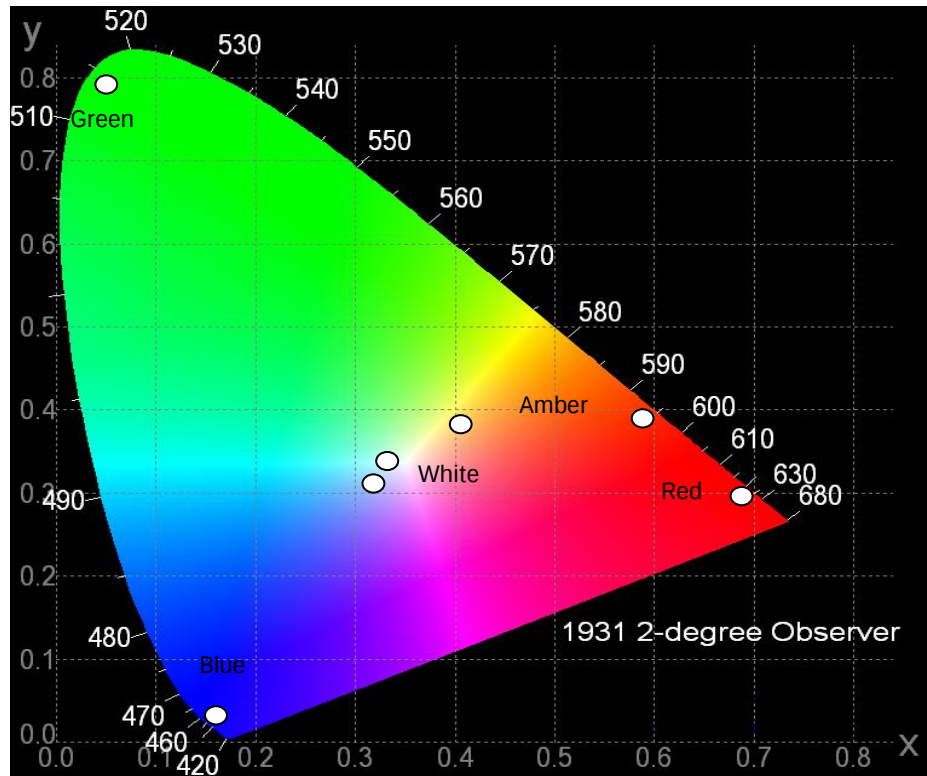
### Internal Electrical Diagram



OPTEK's Optimal XIV Series Solid State Lighting products package the highest quality LED chips. Typically, the lumen output of these can be as high as 70% after 50,000 hours of operation. This prediction is based on specific test results and on tests on similar materials, and relies on strict observation of the design limits and ratings included in this data sheet.

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

## CIE Chromaticity Diagram



## Spatial Intensity Distribution

Normalized Spectral Intensity vs Angular Displacement

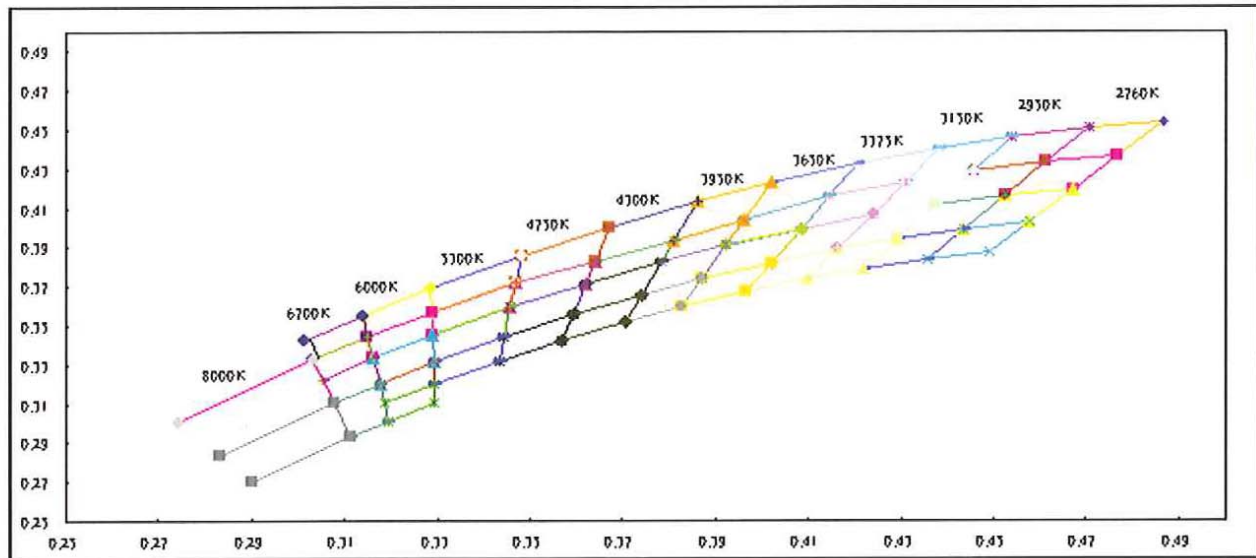
120.1 degrees

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## Chromaticity Coordinates Specifications for Bin Grading

|            |            |            |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|------------|------------|------------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Warm White | Rank       | A01        |            |        |        | A02    |        |        |        | A03    |        |        |        | A04    |        |        |        |        |
|            | X          | 0.4705     | 0.4866     | 0.4767 | 0.4614 | 0.4614 | 0.4767 | 0.4671 | 0.4525 | 0.4525 | 0.4671 | 0.4577 | 0.4436 | 0.4436 | 0.4577 | 0.4490 | 0.4356 |        |
|            | Y          | 0.4508     | 0.4541     | 0.4366 | 0.4333 | 0.4333 | 0.4366 | 0.4196 | 0.4162 | 0.4162 | 0.4196 | 0.4029 | 0.3991 | 0.3991 | 0.4029 | 0.3875 | 0.3837 |        |
|            | CCT        | 2760 (TYP) |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|            | Rank       | B01        |            |        |        | B02    |        |        |        | B03    |        |        |        | B04    |        |        |        |        |
|            | X          | 0.4538     | 0.4705     | 0.4614 | 0.4456 | 0.4456 | 0.4614 | 0.4525 | 0.4376 | 0.4376 | 0.4525 | 0.4436 | 0.4294 | 0.4294 | 0.4436 | 0.4356 | 0.4221 |        |
|            | Y          | 0.4460     | 0.4508     | 0.4333 | 0.4287 | 0.4287 | 0.4333 | 0.4162 | 0.4116 | 0.4116 | 0.4162 | 0.3991 | 0.3943 | 0.3943 | 0.3991 | 0.3837 | 0.3790 |        |
|            | CCT        | 2950 (TYP) |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|            | Rank       | C01        |            |        |        | C02    |        |        |        | C03    |        |        |        | C04    |        |        |        |        |
|            | X          | 0.4385     | 0.4538     | 0.4456 | 0.4312 | 0.4312 | 0.4456 | 0.4376 | 0.4240 | 0.4240 | 0.4376 | 0.4294 | 0.4165 | 0.4165 | 0.4294 | 0.4221 | 0.4100 |        |
|            | Y          | 0.4404     | 0.4460     | 0.4287 | 0.4234 | 0.4234 | 0.4287 | 0.4116 | 0.4065 | 0.4065 | 0.4116 | 0.3943 | 0.3890 | 0.3890 | 0.3943 | 0.3790 | 0.3738 |        |
|            | CCT        | 3150 (TYP) |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|            | Rank       | D01        |            |        |        | D02    |        |        |        | D03    |        |        |        | D04    |        |        |        |        |
|            | X          | 0.4209     | 0.4385     | 0.4312 | 0.4148 | 0.4148 | 0.4312 | 0.4240 | 0.4086 | 0.4086 | 0.4240 | 0.4165 | 0.4021 | 0.4021 | 0.4165 | 0.4100 | 0.3966 |        |
|            | Y          | 0.4326     | 0.4404     | 0.4234 | 0.4161 | 0.4161 | 0.4234 | 0.4065 | 0.3995 | 0.3995 | 0.4065 | 0.3890 | 0.3822 | 0.3822 | 0.3890 | 0.3738 | 0.3673 |        |
|            | White      | CCT        | 3375 (TYP) |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Rank       |            | E01        |            |        |        | E02    |        |        |        | E03    |        |        |        | E04    |        |        |        |        |
| X          |            | 0.4023     | 0.4209     | 0.4148 | 0.3963 | 0.3963 | 0.4148 | 0.4086 | 0.3934 | 0.3924 | 0.4086 | 0.4021 | 0.3871 | 0.3871 | 0.4021 | 0.3966 | 0.3826 |        |
| Y          |            | 0.4228     | 0.4326     | 0.4161 | 0.4035 | 0.4035 | 0.4161 | 0.3995 | 0.3909 | 0.3909 | 0.3995 | 0.3822 | 0.3739 | 0.3739 | 0.3822 | 0.3672 | 0.3595 |        |
| CCT        |            | 3650 (TYP) |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Rank       |            | F01        |            |        |        | F02    |        |        |        | F03    |        |        |        | F04    |        |        |        |        |
| X          |            | 0.3860     | 0.4023     | 0.3963 | 0.3811 | 0.3811 | 0.3963 | 0.3924 | 0.3783 | 0.3783 | 0.3924 | 0.3871 | 0.3741 | 0.3741 | 0.3871 | 0.3826 | 0.3706 |        |
| Y          |            | 0.4130     | 0.4228     | 0.4035 | 0.3937 | 0.3937 | 0.4035 | 0.3909 | 0.3825 | 0.3825 | 0.3909 | 0.3739 | 0.3658 | 0.3658 | 0.3739 | 0.3595 | 0.3520 |        |
| CCT        |            | 3950 (TYP) |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Rank       |            | G01        |            |        |        | G02    |        |        |        | G03    |        |        |        | G04    |        |        |        |        |
| X          |            | 0.3673     | 0.3860     | 0.3811 | 0.3642 | 0.3642 | 0.3811 | 0.3783 | 0.3622 | 0.3622 | 0.3783 | 0.3741 | 0.3594 | 0.3594 | 0.3741 | 0.3706 | 0.3571 |        |
| Y          |            | 0.4003     | 0.4130     | 0.3937 | 0.3829 | 0.3829 | 0.3937 | 0.3825 | 0.3716 | 0.3716 | 0.3825 | 0.3658 | 0.3557 | 0.3557 | 0.3658 | 0.3520 | 0.3426 |        |
| CCT        |            | 4300 (TYP) |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Cool White |            | Rank       | H01        |        |        |        | H02    |        |        |        | H03    |        |        |        | H04    |        |        |        |
|            |            | X          | 0.3481     | 0.3673 | 0.3642 | 0.3469 | 0.3469 | 0.3642 | 0.3622 | 0.3458 | 0.3458 | 0.3622 | 0.3594 | 0.3444 | 0.3444 | 0.3594 | 0.3571 | 0.3434 |
|            |            | Y          | 0.3856     | 0.4003 | 0.3829 | 0.3717 | 0.3717 | 0.3829 | 0.3716 | 0.3592 | 0.3592 | 0.3716 | 0.3557 | 0.3442 | 0.3442 | 0.3557 | 0.3426 | 0.3320 |
|            | CCT        | 4750 (TYP) |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|            | Rank       | I01        |            |        |        | I02    |        |        |        | I03    |        |        |        | I04    |        |        |        |        |
|            | X          | 0.3286     | 0.3481     | 0.3469 | 0.3288 | 0.3288 | 0.3469 | 0.3458 | 0.3290 | 0.3290 | 0.3458 | 0.3444 | 0.3292 | 0.3292 | 0.3444 | 0.3434 | 0.3294 |        |
|            | Y          | 0.3690     | 0.3856     | 0.3717 | 0.3569 | 0.3569 | 0.3717 | 0.3592 | 0.3451 | 0.3451 | 0.3592 | 0.3442 | 0.3313 | 0.3313 | 0.3442 | 0.3320 | 0.3202 |        |
|            | CCT        | 5300 (TYP) |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|            | Rank       | J01        |            |        |        | J02    |        |        |        | J03    |        |        |        | J04    |        |        |        |        |
|            | X          | 0.3136     | 0.3286     | 0.3288 | 0.3148 | 0.3148 | 0.3288 | 0.3290 | 0.3160 | 0.3160 | 0.3290 | 0.3292 | 0.3175 | 0.3175 | 0.3292 | 0.3291 | 0.3186 |        |
|            | Y          | 0.3550     | 0.3690     | 0.3569 | 0.3444 | 0.3444 | 0.3569 | 0.3451 | 0.3332 | 0.3332 | 0.3451 | 0.3313 | 0.3204 | 0.3204 | 0.3313 | 0.3202 | 0.3102 |        |
|            | CCT        | 6000 (TYP) |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|            | Rank       | J05        |            |        |        | K01    |        |        |        | K02    |        |        |        | K03    |        |        |        |        |
|            | X          | 0.3186     | 0.3294     | 0.3295 | 0.3196 | 0.3011 | 0.3136 | 0.3148 | 0.3031 | 0.3031 | 0.3148 | 0.3160 | 0.3052 | 0.3052 | 0.3160 | 0.3175 | 0.3076 |        |
|            | Y          | 0.3102     | 0.3202     | 0.3105 | 0.3013 | 0.3422 | 0.3550 | 0.3444 | 0.3327 | 0.3327 | 0.3444 | 0.3332 | 0.3224 | 0.3224 | 0.3332 | 0.3204 | 0.3108 |        |
|            | CCT        | 6700 (TYP) |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Rank       | K04        |            |            |        | L01    |        |        |        | L02    |        |        |        |        |        |        |        |        |        |
| X          | 0.3076     | 0.3175     | 0.3196     | 0.3111 | 0.2742 | 0.3031 | 0.3076 | 0.2830 | 0.2830 | 0.3076 | 0.3112 | 0.2900 |        |        |        |        |        |        |
| Y          | 0.3108     | 0.3204     | 0.3013     | 0.2932 | 0.3007 | 0.3327 | 0.3108 | 0.2838 | 0.2838 | 0.3108 | 0.2932 | 0.2703 |        |        |        |        |        |        |
| CCT        | 8000 (TYP) |            |            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.



## Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

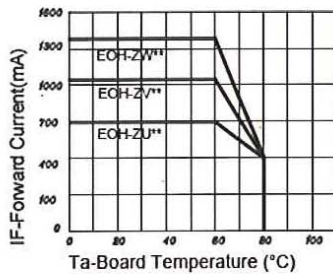


Fig.1 Allowable Forward Current vs. Ambient Temperature

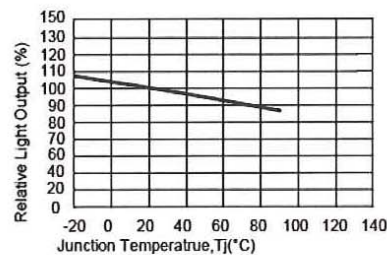


Fig.2 Luminous Intensity vs. Forward Current

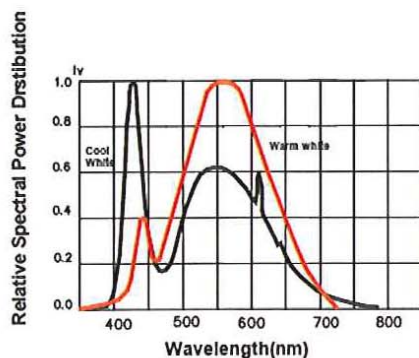


Fig.3 Relative Luminous Intensity vs. Wavelength

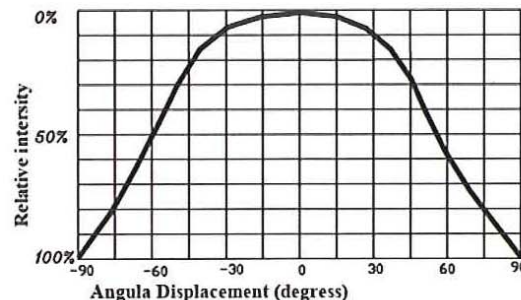


Fig.4 Typical Representative Spatial Radiation Pattern of Single LED

Note: 1. The data shown above are typical curves. Every LED component may have some variations of characteristics.  
2. The maximum driving current should be limited in proper value ( see Fig. 1 above) and use of an adequate heat sink

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

# Optimal XIV COS Star

## OV14Zxx Series

### Reliability Criteria & Results

EOI's High Power LED s are checked by reliability test based on MIL standards.

#### 1. Test Conditions, Accept Criteria & Results:

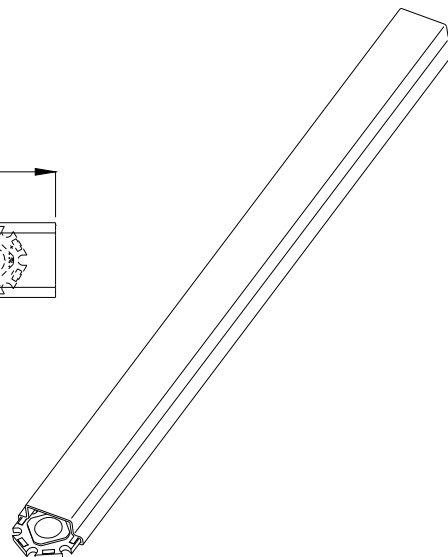
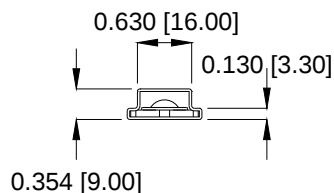
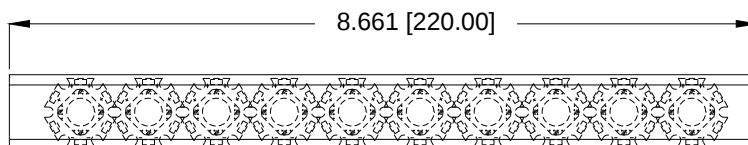
| Classification   | Test Item                | Reference Standard    | Test Conditions                                                                                                                     | Duration | Units Tested | Number of Damaged |
|------------------|--------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------|--------------|-------------------|
| Operation Test   | Operating Life Test      |                       | $T_A = 25^{\circ}\text{C} \pm 5^{\circ}\text{C}$                                                                                    | 1000 Hrs | 22           | 0/22              |
|                  |                          |                       | OV14Zxx-1 $I_F = 700\text{mA}$                                                                                                      |          |              |                   |
|                  |                          |                       | OV14Zxx-2 $I_F = 1050\text{mA}$                                                                                                     |          |              |                   |
|                  |                          |                       | OV14Zxx-3 $I_F = 1400\text{mA}$                                                                                                     |          |              |                   |
| Environment Test | High Temperature Storage | JEITA ED-4701 200 201 | $T_A = 100^{\circ}\text{C} \pm 5^{\circ}\text{C}$                                                                                   | 1000 Hrs | 22           | 0/22              |
|                  | Low Temperature          | JEITA ED-4701 200 201 | $T_A = -40^{\circ}\text{C} \pm 5^{\circ}\text{C}$                                                                                   | 1000 Hrs | 22           | 0/22              |
|                  | Thermal Shock            | JEITA ED-4701 200 201 | $-40^{\circ}\text{C} \pm 5^{\circ}\text{C} \leftrightarrow +85^{\circ}\text{C} \pm 5^{\circ}\text{C}$<br>30min dwell/5 min transfer | 50Cycles | 22           | 0/22              |

#### 2. Reliability Criteria:

| Item            | Symbol | Test Conditions                  | Criteria for Judgement |                    |
|-----------------|--------|----------------------------------|------------------------|--------------------|
|                 |        |                                  | Min                    | Max                |
| Forward Voltage | $V_F$  | OV14Zxx-1 $I_F = 700\text{ mA}$  | ----                   | Initial Data x 1.1 |
|                 |        | OV14Zxx-2 $I_F = 1050\text{ mA}$ |                        |                    |
|                 |        | OV14Zxx-3 $I_F = 1400\text{ mA}$ |                        |                    |
| Luminous Flux   | 1m     | OV14Zxx-1 $I_F = 700\text{ mA}$  | Initial Data x 0.5     | ----               |
|                 |        | OV14Zxx-2 $I_F = 1050\text{ mA}$ |                        |                    |
|                 |        | OV14Zxx-3 $I_F = 1400\text{ mA}$ |                        |                    |

#### Shipment Packaging and Packing:

1. Packaging quantity : 10 stars / tube
2. Packing box contains 10 tubes



OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

# Mouser Electronics

Authorized Distributor

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[OV14ZWW-3](#)