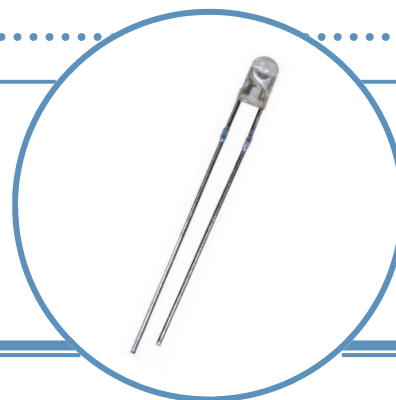


# Round Through-Hole LED Lamp (3 mm)

## OVLBx4C7 Series

- High brightness with well-defined spatial radiation patterns
- UV-resistant epoxy lens
- Lead-frame material is iron alloy with tin plated leads
- No stand-offs

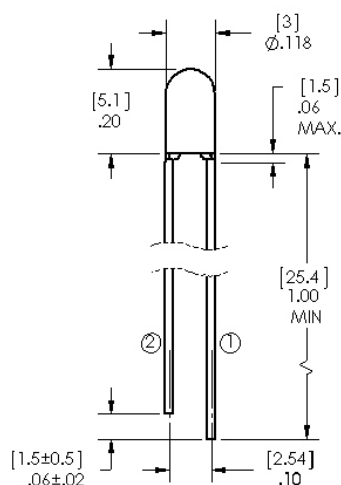


Each **OVLBx4C7** series device is a high-intensity LED mounted in a clear plastic T-1 package. The LED provides a well-defined and even emission pattern. Its UV-resistant epoxy lens makes this device an optimal solution for outdoor applications.

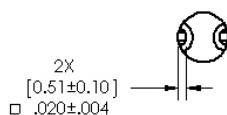
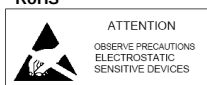
## Applications

- Pedestrian signals
- Signage and architectural lighting
- Backlighting
- Automotive
- Outdoor/indoor displays

| Part Number | Material | Emitted Color | Intensity Typ. mcd | Lens Color |
|-------------|----------|---------------|--------------------|------------|
| OVLBB4C7    | InGaN    | Blue          | 1800               | Clear      |
| OVLBG4C7    |          | Green         | 8400               | Clear      |
| OVLBR4C7    | AlInGaP  | Red           | 3700               | Clear      |
| OVLBY4C7    |          | Yellow        | 3700               | Clear      |



RoHS



General tolerance +/- .25mm unless specified

- ① ANODE  
② CATHODE

Dimensions are in Inches [MM]

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

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# Round Through-Hole LED (3 mm)

## OVLBx4C7 Series



### Absolute Maximum Ratings (T<sub>A</sub> = 25° C unless otherwise noted)

|                                                                              |             |                   |
|------------------------------------------------------------------------------|-------------|-------------------|
| Storage Temperature Range                                                    |             | -40 ~ +100 °C     |
| Operating Temperature Range                                                  |             | -40 ~ +100 °C     |
| Reverse Voltage (Device not designed for reverse voltage applications)       |             | 5 V Max           |
| Continuous Forward Current (Design of heat dissipation should be considered) | Blue, Green | 25 mA             |
|                                                                              | Red, Yellow | 50 mA             |
| Peak Forward Current (10% Duty Cycle, 1 kHz)                                 | Blue, Green | 100 mA            |
|                                                                              | Red, Yellow | 100 mA            |
| Power Dissipation                                                            | Blue, Green | 100 mW            |
|                                                                              | Red, Yellow | 120 mW            |
| Current Linearity vs Ambient Temperature                                     | Blue, Green | -0.29 mA/°C       |
|                                                                              | Red, Yellow | -0.72 mA/°C       |
| LED Junction Temperature                                                     |             | 125°C             |
| Electrostatic Discharge Classification (JEDEC-JESD22-A114F)                  |             | Class 1C          |
| Lead Soldering Temperature (4 mm away from the base of the epoxy bulb)       |             | 260°C / 3 seconds |

### Electrical Characteristics (T<sub>A</sub> = 25° C unless otherwise noted)

| SYMBOL         | PARAMETER           | COLOR  | MIN  | TYP  | MAX  | UNITS | CONDITIONS             |
|----------------|---------------------|--------|------|------|------|-------|------------------------|
| I <sub>V</sub> | Luminous Intensity  | Blue   | 1135 | 1800 | ---- | mcd   | I <sub>F</sub> = 20 mA |
|                |                     | Green  | 4360 | 8400 | ---- |       |                        |
|                |                     | Red    | 2225 | 3700 | ---- |       |                        |
|                |                     | Yellow | 2225 | 3700 | ---- |       |                        |
| V <sub>F</sub> | Forward Voltage     | Blue   | 2.6  | 3.2  | 4.0  | V     | I <sub>F</sub> = 20 mA |
|                |                     | Green  |      |      |      |       |                        |
|                |                     | Red    | 1.8  | 2.0  | 2.4  |       |                        |
|                |                     | Yellow |      |      |      |       |                        |
| I <sub>R</sub> | Reverse Current     | Blue   | ---- | ---- | 10   | μA    | V <sub>R</sub> = 5 V   |
|                |                     | Green  | ---- | ---- |      |       |                        |
|                |                     | Red    | ---- | ---- |      |       |                        |
|                |                     | Yellow | ---- | ---- |      |       |                        |
| λ <sub>D</sub> | Dominant Wavelength | Blue   | 460  | 470  | 475  | nm    | I <sub>F</sub> = 20 mA |
|                |                     | Green  | 519  | 525  | 531  |       |                        |
|                |                     | Red    | 620  | 623  | 630  |       |                        |
|                |                     | Yellow | 585  | 589  | 595  |       |                        |
| 2Θ½H-H         | 50% Power Angle     |        | ---- | 45   | ---- | deg   | I <sub>F</sub> = 20 mA |

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# Round Through-Hole LED (3 mm)

## OVLBx4C7 Series



### Standard Bins

LEDs are sorted to luminous intensity ( $I_V$ ), forward voltage ( $V_F$ ) and dominant wavelength (nm) bins listed below. Each bag consists of a single intensity bin, single voltage bin and a single color bin. Orders are filled using all intensity and color bins listed in the following tables. Optek will not accept orders for single intensity bins, single voltage bins or single color bins.

#### Luminous Intensity ( $I_V$ ) @ 20mA

| Blue: OVLBB4C7  |           |           |
|-----------------|-----------|-----------|
| IV Code         | Min (mcd) | Max (mcd) |
| 0S              | 1,135     | 1,590     |
| 0T              | 1,590     | 2,225     |
| 0U              | 2,225     | 3,115     |
| 0V              | 3,115     | 4,360     |
| Green: OVLBG4C7 |           |           |
| IV Code         | Min (mcd) | Max (mcd) |
| 0W              | 4,360     | 6,105     |
| 0X              | 6,105     | 8,550     |
| 0Y              | 8,550     | 11,970    |
| 0Z              | 11,970    | 16,758    |

#### Forward Voltage ( $V_F$ )

| Blue: OVLBB4C7 & Green: OVLBG4C7 |     |     |
|----------------------------------|-----|-----|
| VF Code                          | Min | Max |
| A                                | 2.6 | 2.8 |
| B                                | 2.8 | 3.0 |
| C                                | 3.0 | 3.2 |
| D                                | 3.2 | 3.4 |
| E                                | 3.4 | 3.6 |
| F                                | 3.6 | 3.8 |
| G                                | 3.8 | 4.0 |

#### Dominant Wavelength (nm)

| Blue: OVLBB4C7  |     |     |
|-----------------|-----|-----|
| nm Code         | Min | Max |
| BC              | 460 | 465 |
| BD              | 465 | 470 |
| BE              | 470 | 475 |
| Green: OVLBG4C7 |     |     |
| nm Code         | Min | Max |
| FB              | 519 | 523 |
| FC              | 523 | 527 |
| FD              | 527 | 531 |

#### Luminous Intensity ( $I_V$ ) @ 20mA

| Red: OVLBR4C7    |           |           |
|------------------|-----------|-----------|
| IV Code          | Min (mcd) | Max (mcd) |
| 0U               | 2,225     | 3,115     |
| 0V               | 3,115     | 4,360     |
| 0W               | 4,360     | 6,105     |
| Yellow: OVLBY4C7 |           |           |
| IV Code          | Min (mcd) | Max (mcd) |
| 0U               | 2,225     | 3,115     |
| 0V               | 3,115     | 4,360     |
| 0W               | 4,360     | 6,105     |

#### Forward Voltage ( $V_F$ )

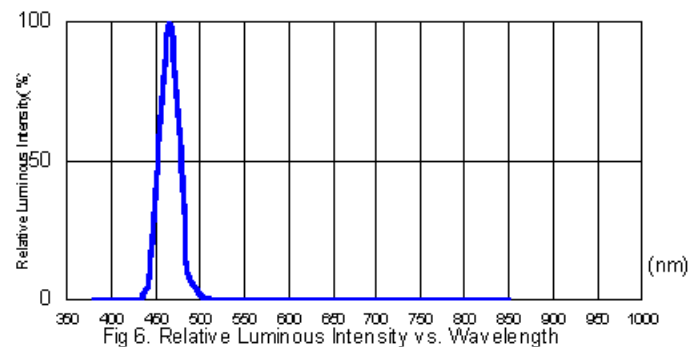
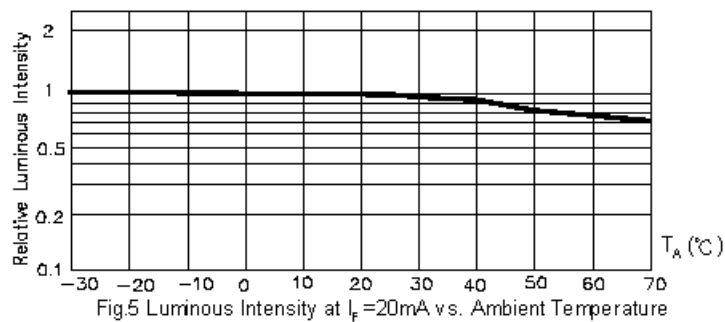
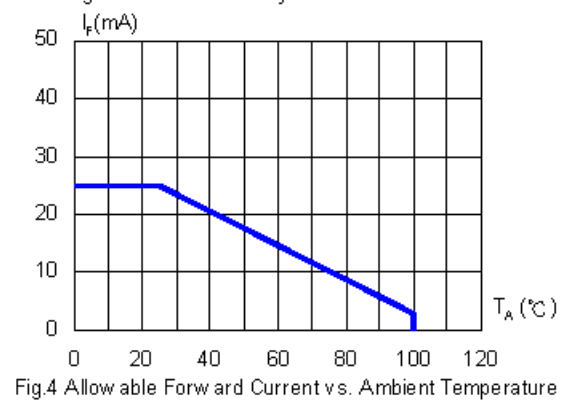
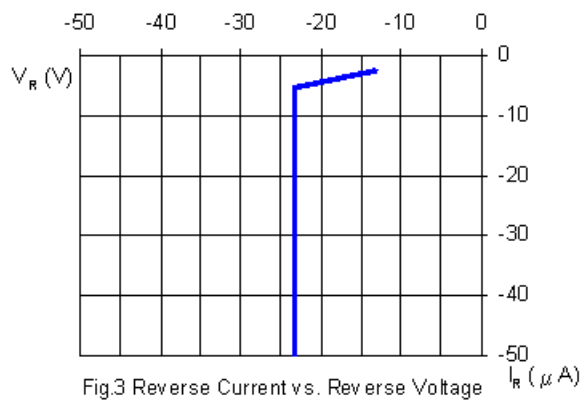
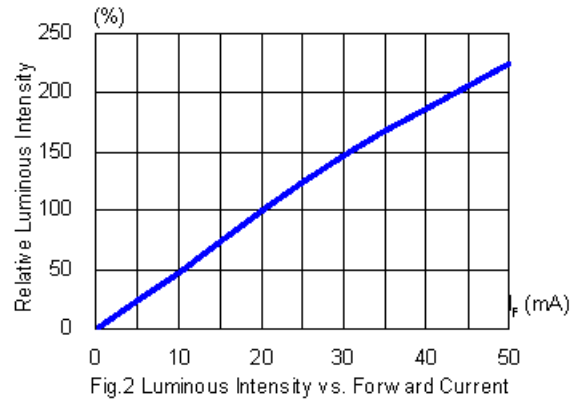
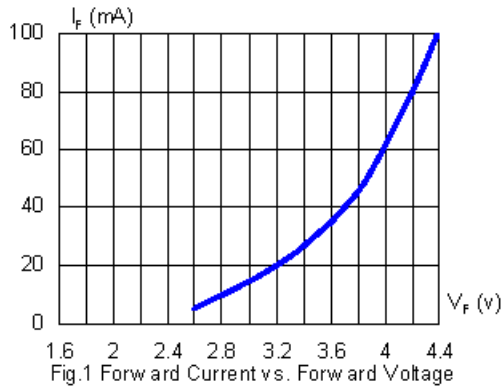
| Red: OVLBR4C7 & Yellow: OVLBY4C7 |     |     |
|----------------------------------|-----|-----|
| VF Code                          | Min | Max |
| A                                | 1.8 | 2.0 |
| B                                | 2.0 | 2.2 |
| C                                | 2.2 | 2.4 |

#### Dominant Wavelength (nm)

| Red: OVLBR4C7    |     |     |
|------------------|-----|-----|
| nm Code          | Min | Max |
| RA               | 620 | 625 |
| RB               | 625 | 630 |
| Yellow: OVLBY4C7 |     |     |
| nm Code          | Min | Max |
| YC               | 585 | 587 |
| YD               | 587 | 589 |
| YE               | 589 | 591 |
| YF               | 591 | 593 |
| YG               | 593 | 595 |

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## Typical Electro-Optical Characteristics Curves (BLUE)



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## Typical Electro-Optical Characteristics Curves (GREEN)

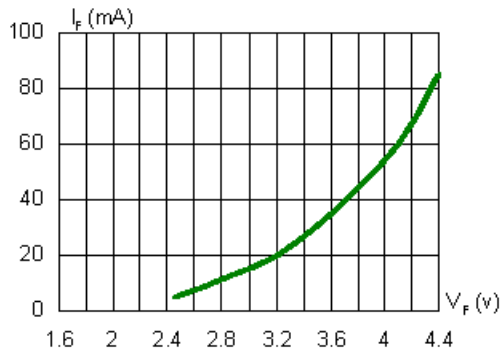


Fig.1 Forward Current vs. Forward Voltage

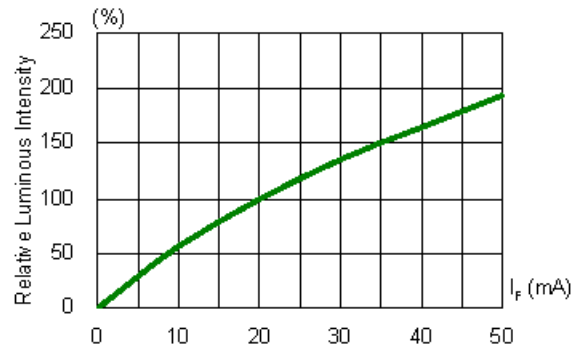


Fig.2 Luminous Intensity vs. Forward Current

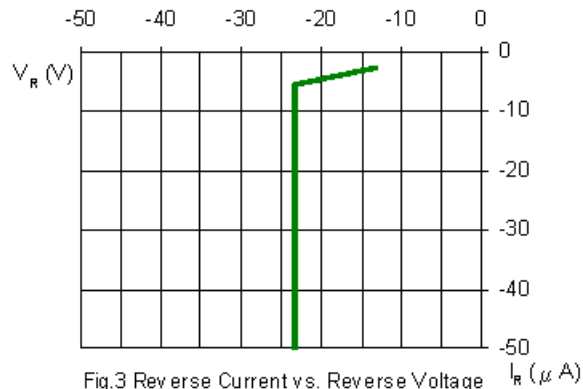


Fig.3 Reverse Current vs. Reverse Voltage

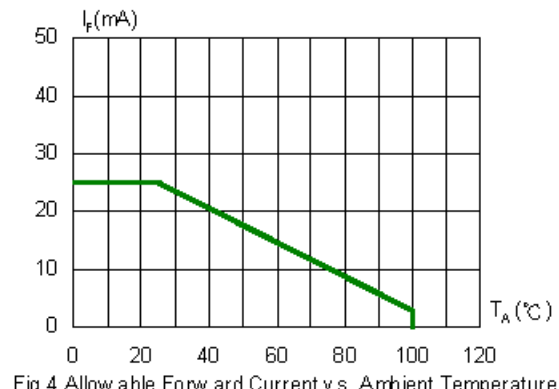


Fig.4 Allowable Forward Current vs. Ambient Temperature

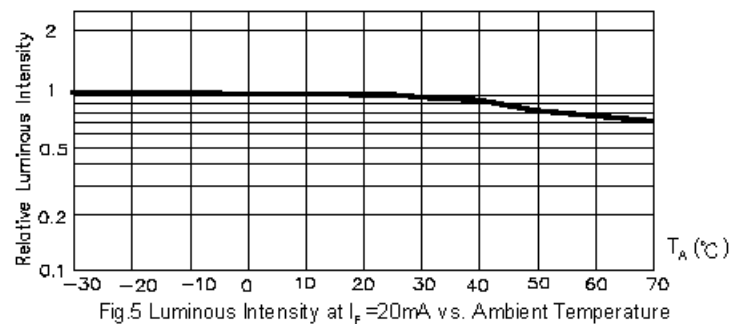


Fig.5 Luminous Intensity at  $I_F=20mA$  vs. Ambient Temperature

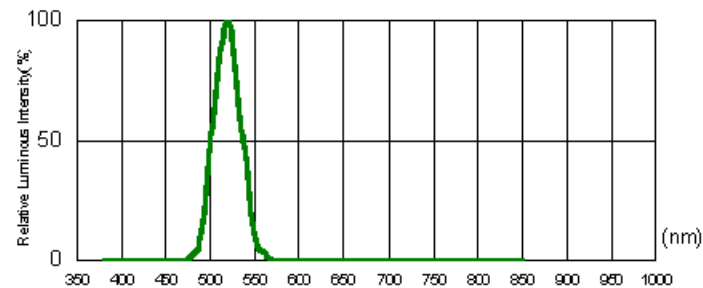


Fig.6. Relative Luminous Intensity vs. Wavelength

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## Typical Electro-Optical Characteristics Curves (RED)

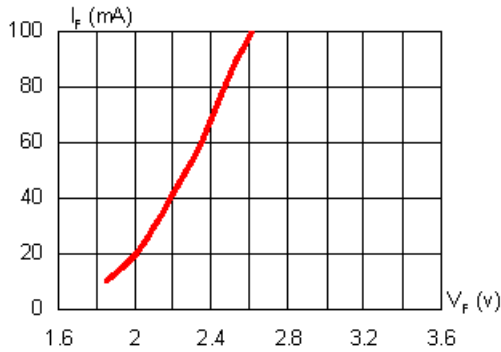


Fig.1 Forward Current vs. Forward Voltage

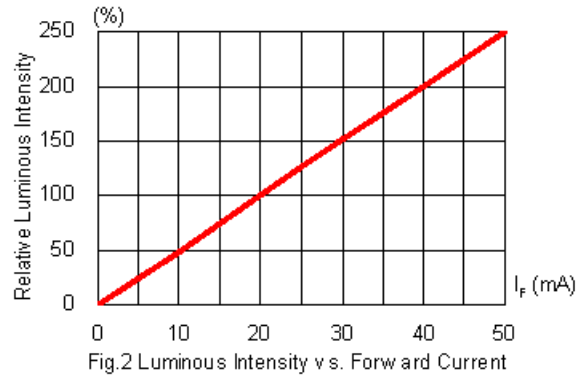


Fig.2 Luminous Intensity vs. Forward Current

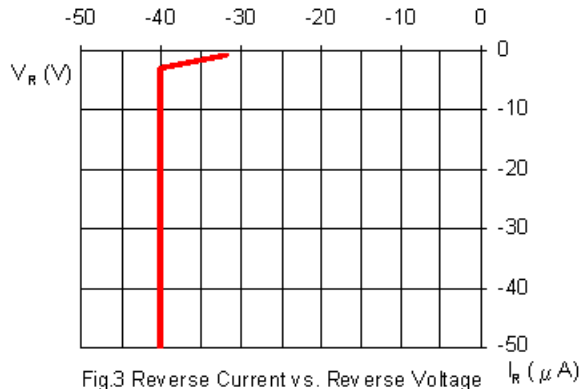


Fig.3 Reverse Current vs. Reverse Voltage

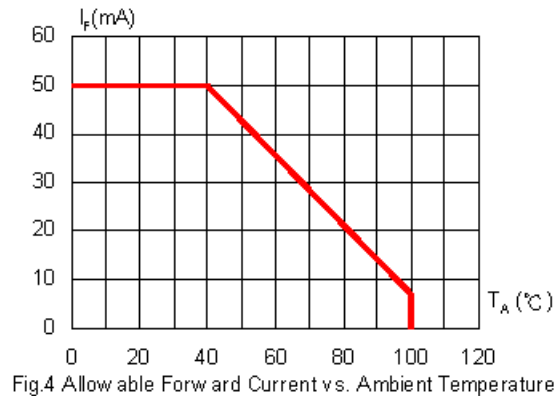


Fig.4 Allowable Forward Current vs. Ambient Temperature

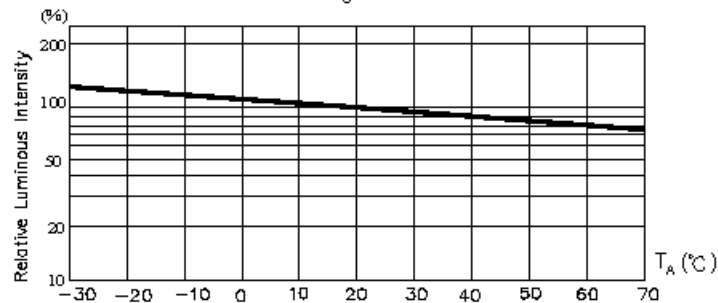


Fig.5 Luminous Intensity at  $I_F = 20mA$  vs. Ambient Temperature

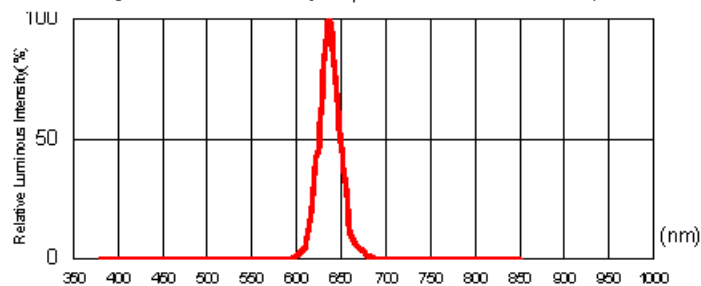


Fig.6. Relative Luminous Intensity vs. Wavelength

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## Typical Electro-Optical Characteristics Curves (YELLOW)

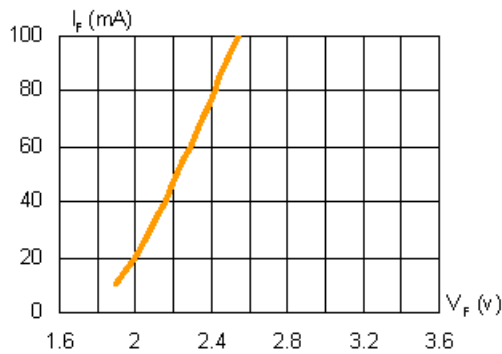


Fig.1 Forward Current vs. Forward Voltage

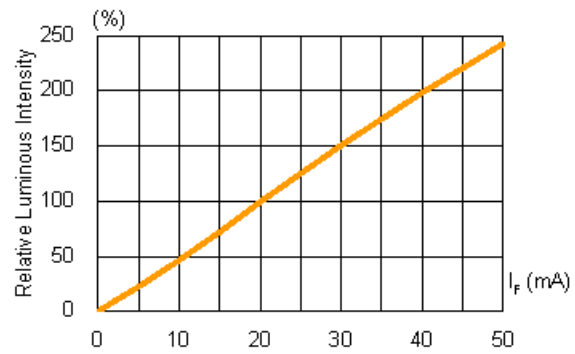


Fig.2 Luminous Intensity vs. Forward Current

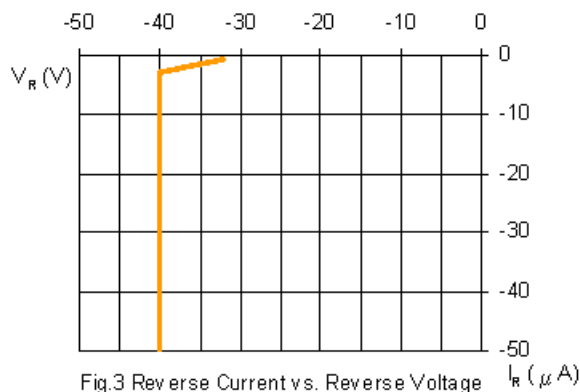


Fig.3 Reverse Current vs. Reverse Voltage

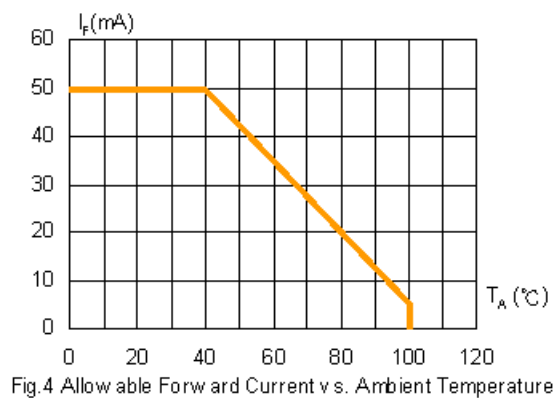


Fig.4 Allowable Forward Current vs. Ambient Temperature

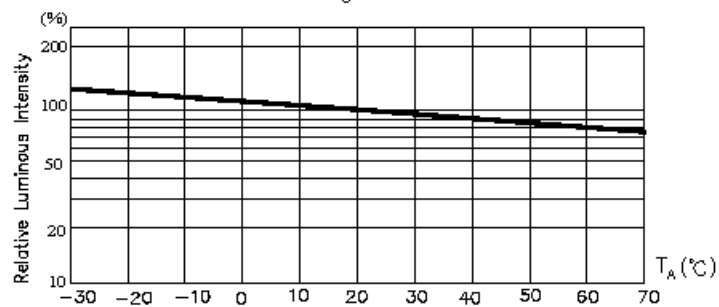


Fig.5 Luminous Intensity at  $I_F=20mA$  vs. Ambient Temperature

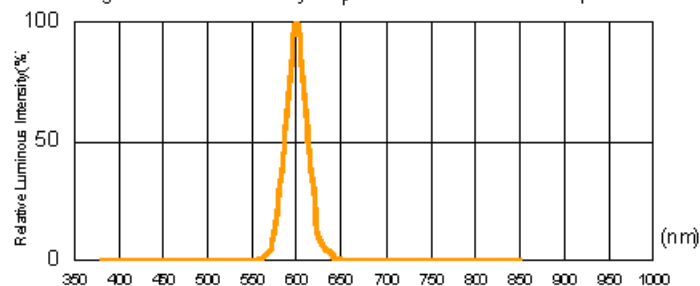


Fig.6. Relative Luminous Intensity vs. Wavelength

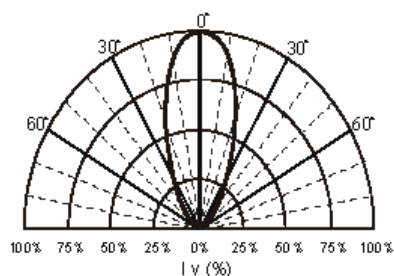
OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

# Round Through-Hole LED (3 mm)

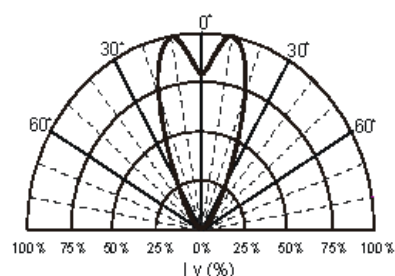
## OVLBx4C7 Series

### Beam Pattern:

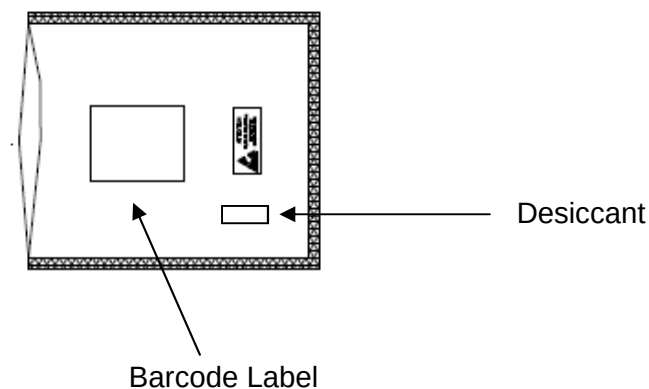
(Blue) and (Green)



(Red) and (Yellow)



Packaging: 500 pcs per bulk bag with desiccant



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# Round Through-Hole LED (3 mm)

OVLBx4C7 Series

## Reliability Test

LED lamps are checked by reliability tests based on MIL standards.

| Classification   | Test Item                           | Standard<br>Test Method       | Test Conditions                                                                                                         | Duration      | Unit | Acc / Rej<br>Criteria | Result |
|------------------|-------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------|------|-----------------------|--------|
| Life<br>Test     | Operation Life Test<br>(OLT)        | MIL-STD-750D<br>Method 1026.3 | $T_A=25^{\circ}\text{C}$ , $I_F=30\text{mA}$ *                                                                          | 1000 Hrs      | 100  | 0 / 1                 | Pass   |
| Environment Test | High Temperature<br>Storage (HTS)   | MIL-STD-750D<br>Method 1032.1 | $T_A=100^{\circ}\text{C}$                                                                                               | 1000 Hrs      | 100  | 0 / 1                 | Pass   |
|                  | Low Temperature<br>Storage (LTS)    | MIL-STD-750D<br>Method 1032.1 | $T_A=-40^{\circ}\text{C}$                                                                                               | 1000 Hrs      | 100  | 0 / 1                 | Pass   |
|                  | Temp. & Humidity<br>with Bias (THB) | MIL-STD-750D<br>Method 103B   | $T_A=85^{\circ}\text{C}$ , $R_h=85\%$ $I_F=20\text{mA}$ **                                                              | 500 Hrs       | 100  | 0 / 1                 | Pass   |
|                  | Thermal Shock<br>Test (TST)         | MIL-STD-750D<br>Method 1056.1 | $0^{\circ}\text{C} \sim 100^{\circ}\text{C}$<br>2min 2min                                                               | 100<br>cycles | 100  | 0 / 1                 | Pass   |
|                  | Temperature<br>Cycling Test (TCT)   | MIL-STD-750D<br>Method 1051.5 | $-40^{\circ}\text{C} \sim 25^{\circ}\text{C} \sim 100^{\circ}\text{C} \sim 25^{\circ}\text{C}$<br>30min 5min 30min 5min | 100<br>cycles | 100  | 0 / 1                 | Pass   |
| Mechanical Test  | Solderability                       | MIL-STD-750D<br>Method 2026.4 | $235\pm 5^{\circ}\text{C}$ , 5 sec                                                                                      | 1 time        | 20   | 0 / 1                 | Pass   |
|                  | Resistance to<br>Soldering Heat     | MIL-STD-750D<br>Method 2031.1 | $260\pm 5^{\circ}\text{C}$ , 10 sec                                                                                     | 1 time        | 20   | 0 / 1                 | Pass   |
|                  | Lead Integrity                      | MIL-STD-750D<br>Method 2036.3 | Load 2.5N (0.25kgf)<br>$0^{\circ} \sim 90^{\circ} \sim 0^{\circ}$ , bend                                                | 3 times       | 20   | 0 / 1                 | Pass   |

Remark : (\*)  $I_F=30\text{mA}$  for AlInGaP chip ;  $I_F=20\text{mA}$  for InGaP chip

(\*\*)  $I_F=20\text{mA}$  for AlInGaP chip ;  $I_F=10\text{mA}$  for InGaP chip

## 2. Failure Criteria ( $T_A=25^{\circ}\text{C}$ ):

| Test Item          | Symbol | Test Conditions    | Criteria for Judgment |                    |
|--------------------|--------|--------------------|-----------------------|--------------------|
|                    |        |                    | Min.                  | Max.               |
| Luminous Intensity | $I_V$  | $I_F=20\text{ mA}$ | $LSL \times 0.7$ **   |                    |
| Voltage (Forward)  | $V_F$  | $I_F=20\text{ mA}$ |                       | $USL \times 1.1$ * |

(\*) USL : Upper Standard Level , (\*\*) LSL : Lower Standard Level

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