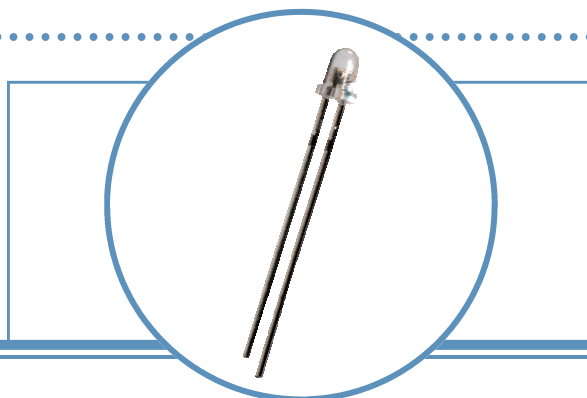


# White High-Intensity LED Lamp (3 mm, 40° Viewing Angle)

## OVLAW4CB7

- High luminous intensity
- Through-hole type
- Clear lens
- High efficiency

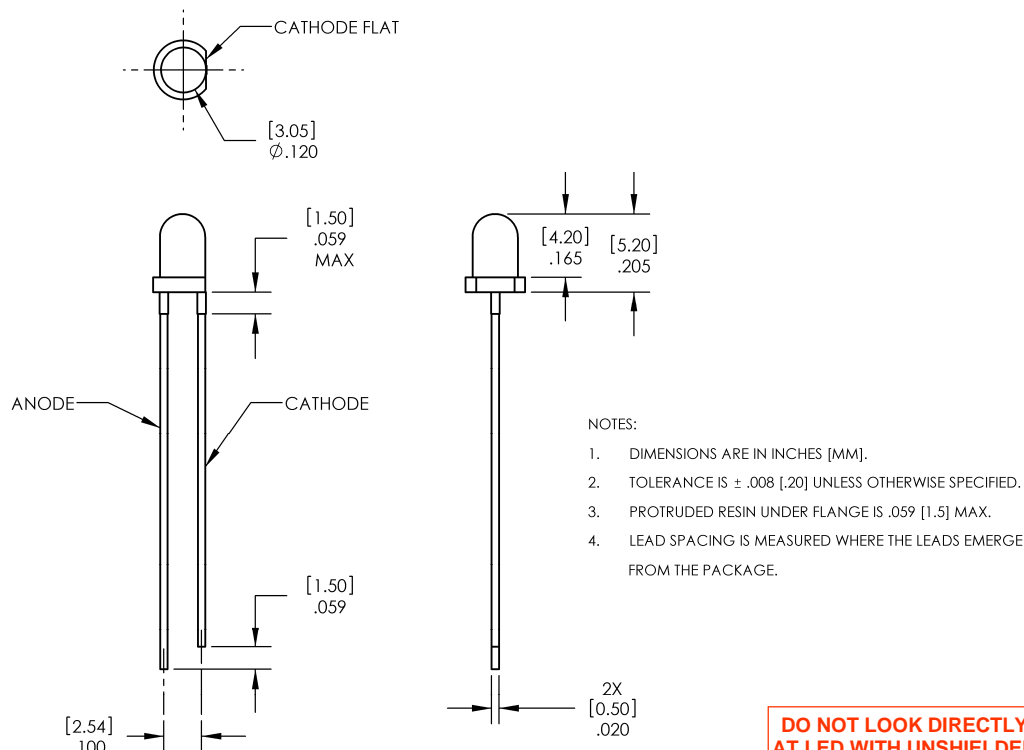


The **OVLAW4CB7** is a round 3mm white high-intensity through-hole lamp with a 40° viewing angle. It is designed for wide-angle uniform light output.

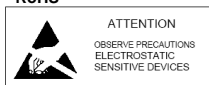
## Applications

- Indicators for medical, industrial, consumer and office equipment
- Indicators for white goods and home appliances
- Interior and exterior architectural and accent lighting
- Signs and digital information displays, video screen non-color and RGB presentation
- Automotive backlighting and indicators

| Part Number | Material | Emitted Color | Intensity Typ. mcd | Lens Color |
|-------------|----------|---------------|--------------------|------------|
| OVLAW4CB7   | InGaN    | White         | 6200               | Clear      |



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.

# White High-Intensity LED Lamp

## OVLA4CB7



### 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  | 5 V           |
| Power Dissipation  | 100 mW        |
| Average Forward Current  | 25 mA         |
| Peak Forward Current (Duty Ratio = 1/10, Pulse Width = 0.1 ms) | 100 mA        |
| Current Linearity vs Ambient Temperature                       | -0.29 mA/° C  |
| LED Junction Temperature                                       | 125° C        |
| Electrostatic Discharge Classification (JEDEC-JESD22-A114F)    | Class 1C      |
| Lead Soldering Temperature (5 seconds maximum)                 | 260° C        |

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

| SYMBOL          | PARAMETER                | MIN   | TYP   | MAX  | UNITS | CONDITIONS             |
|-----------------|--------------------------|-------|-------|------|-------|------------------------|
| I <sub>V</sub>  | Luminous Intensity       | 4,360 | 6,200 | ---- | mcd   | I <sub>F</sub> = 20 mA |
| 2θ <sub>½</sub> | 50% Power Angle          | ----  | 40    | ---- | deg   | I <sub>F</sub> = 20 mA |
| V <sub>F</sub>  | Forward Voltage          | ----  | 3.2   | 4.0  | V     | I <sub>F</sub> = 20 mA |
| I <sub>R</sub>  | Reverse Current          | ----  | ----  | 10   | μA    | V <sub>R</sub> = 5 V   |
| x               | Chromaticity Coordinates | ----  | 0.31  | ---- | ----  | I <sub>F</sub> = 20 mA |
| y               |                          | ----  | 0.32  | ---- | ----  | I <sub>F</sub> = 20 mA |

### Standard Bins

LEDs are sorted to the Luminous Intensity (I<sub>V</sub>) Forward Voltage (V<sub>F</sub>) and CCT bins listed below. Each bag consists of a single I<sub>V</sub> bin, a single V<sub>F</sub> bin and a single CCT bin. Orders are filled utilizing all of the I<sub>V</sub>, V<sub>F</sub> and CCT bins listed in the following tables. Optek will not accept orders for single I<sub>V</sub>, V<sub>F</sub> or CCT bins.

| I <sub>V</sub> | Luminous Intensity |           |
|----------------|--------------------|-----------|
|                | Bin                | Min (mcd) |
| 0W             | 4,360              | 6,105     |
| 0X             | 6,105              | 8,550     |
| 0Y             | 8,550              | 11,970    |

| V <sub>F</sub> | Forward Voltage |     |
|----------------|-----------------|-----|
|                | Bin             | Min |
| 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 |

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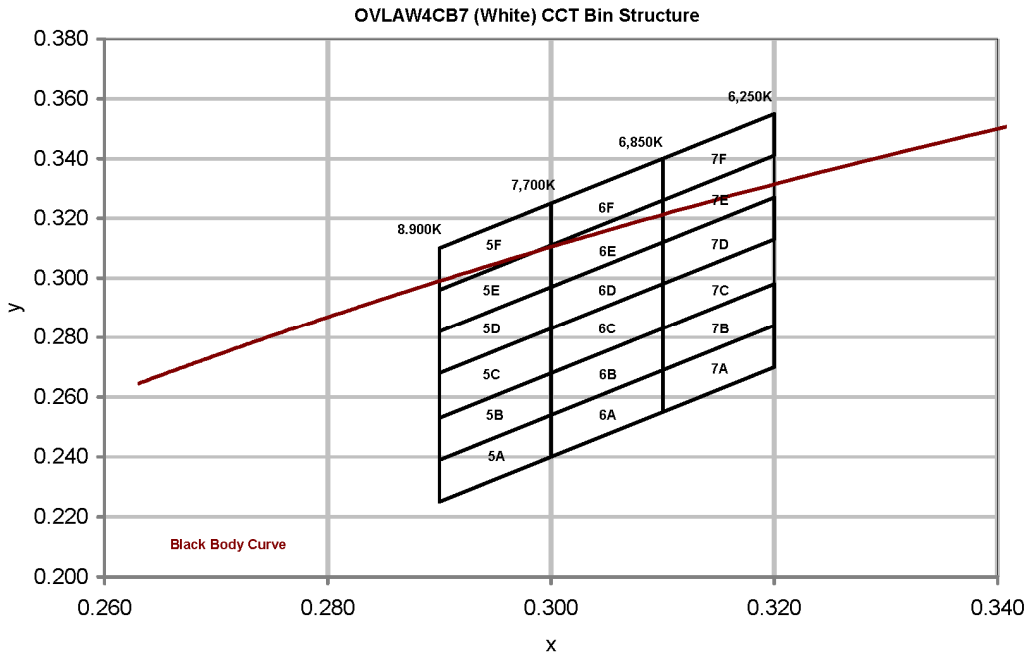
# White High-Intensity LED Lamp

## OVLAW4CB7



### Standard Bins

LEDs are sorted to the Luminous Intensity ( $I_V$ ) Forward Voltage ( $V_F$ ) and CCT bins listed below. Each bag consists of a single  $I_V$  bin, a single  $V_F$  bin and a single CCT bin. Orders are filled utilizing all of the  $I_V$ ,  $V_F$  and CCT bins listed in the following tables. Optek will not accept orders for single  $I_V$ ,  $V_F$  or CCT bins.



### Chromaticity Coordinates (x, y)

| Rank | 5A     |       |       |       | 5B    |       |       |       | 5C    |       |       |       |       |
|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Cx   | Bin 9  | 0.300 | 0.290 | 0.290 | 0.300 | 0.300 | 0.290 | 0.290 | 0.300 | 0.300 | 0.290 | 0.290 | 0.300 |
| Cy   |        | 0.254 | 0.239 | 0.225 | 0.240 | 0.268 | 0.253 | 0.239 | 0.254 | 0.283 | 0.268 | 0.253 | 0.268 |
| Rank | 5D     |       |       |       | 5E    |       |       |       | 5F    |       |       |       |       |
| Cx   | Bin 10 | 0.300 | 0.290 | 0.290 | 0.300 | 0.300 | 0.290 | 0.290 | 0.300 | 0.300 | 0.290 | 0.290 | 0.300 |
| Cy   |        | 0.297 | 0.282 | 0.268 | 0.283 | 0.311 | 0.296 | 0.282 | 0.297 | 0.325 | 0.310 | 0.296 | 0.311 |
| Rank | 6A     |       |       |       | 6B    |       |       |       | 6C    |       |       |       |       |
| Cx   | Bin 11 | 0.310 | 0.300 | 0.300 | 0.310 | 0.310 | 0.300 | 0.300 | 0.310 | 0.310 | 0.300 | 0.300 | 0.310 |
| Cy   |        | 0.269 | 0.254 | 0.240 | 0.255 | 0.283 | 0.268 | 0.254 | 0.269 | 0.298 | 0.283 | 0.268 | 0.283 |
| Rank | 6D     |       |       |       | 6E    |       |       |       | 6F    |       |       |       |       |
| Cx   | Bin 12 | 0.310 | 0.300 | 0.300 | 0.310 | 0.310 | 0.300 | 0.300 | 0.310 | 0.310 | 0.300 | 0.300 | 0.310 |
| Cy   |        | 0.312 | 0.297 | 0.283 | 0.298 | 0.326 | 0.311 | 0.297 | 0.312 | 0.340 | 0.325 | 0.311 | 0.326 |
| Rank | 7A     |       |       |       | 7B    |       |       |       | 7C    |       |       |       |       |
| Cx   | Bin 13 | 0.310 | 0.320 | 0.320 | 0.310 | 0.310 | 0.320 | 0.320 | 0.310 | 0.310 | 0.320 | 0.320 | 0.310 |
| Cy   |        | 0.269 | 0.284 | 0.270 | 0.255 | 0.283 | 0.298 | 0.284 | 0.269 | 0.298 | 0.313 | 0.298 | 0.283 |
| Rank | 7D     |       |       |       | 7E    |       |       |       | 7F    |       |       |       |       |
| Cx   | Bin 14 | 0.310 | 0.320 | 0.320 | 0.310 | 0.310 | 0.320 | 0.320 | 0.310 | 0.310 | 0.320 | 0.320 | 0.310 |
| Cy   |        | 0.312 | 0.327 | 0.313 | 0.298 | 0.326 | 0.341 | 0.327 | 0.312 | 0.340 | 0.355 | 0.341 | 0.326 |

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### Typical Electro-Optical Characteristics Curves

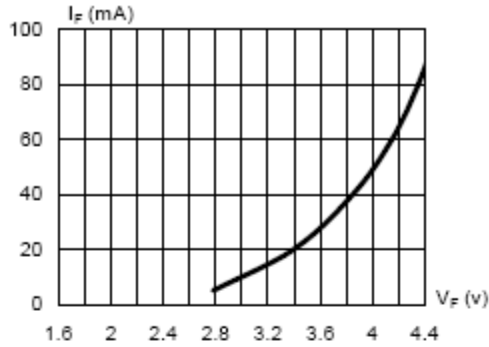


Fig.1 Forward Current vs. Forward Voltage

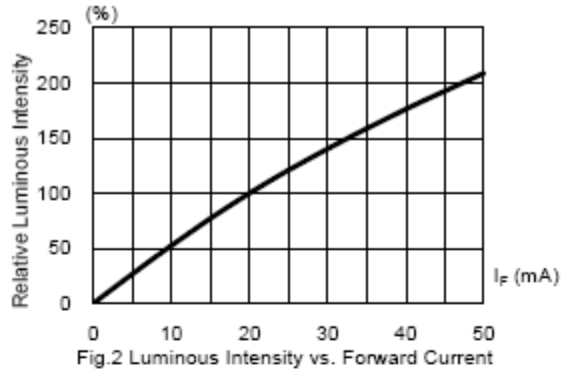


Fig.2 Luminous Intensity vs. Forward Current

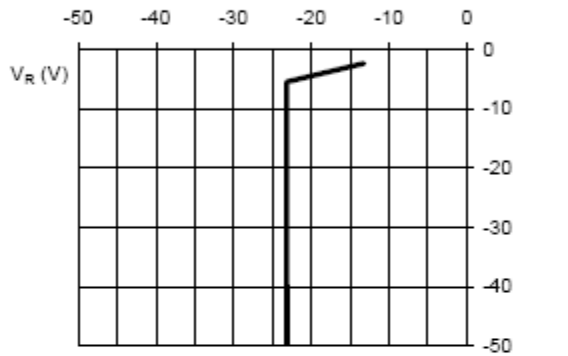


Fig.3 Reverse Current vs. Reverse Voltage

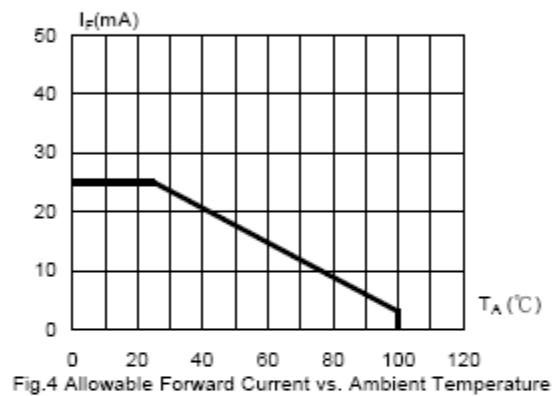


Fig.4 Allowable Forward Current vs. Ambient Temperature

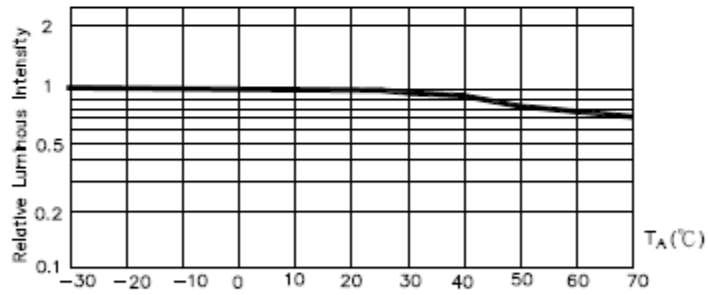


Fig.5 Luminous Intensity at  $I_F=20mA$  vs. Ambient Temperature

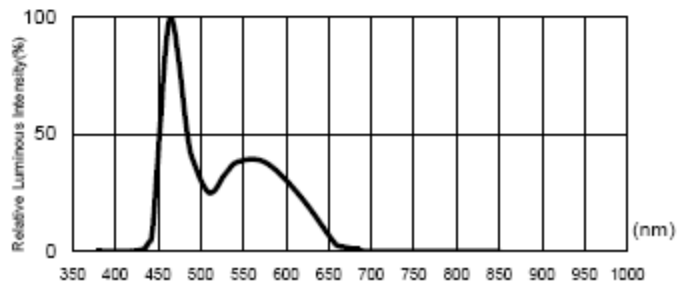
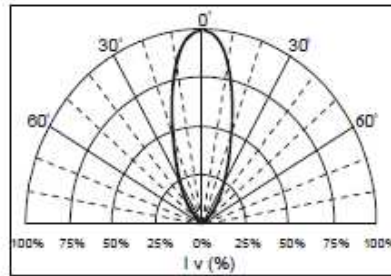


Fig.6. Relative Luminous Intensity vs. Wavelength

Note: The data shown above are typical curves. Every LED component may have some variations.

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Beam Pattern



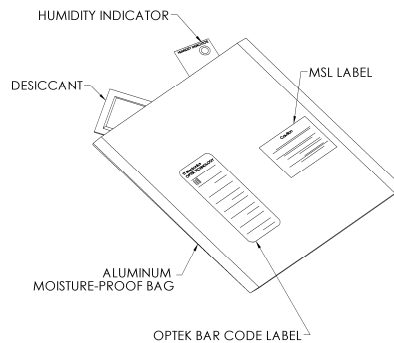
Soldering:

Soldering heat may damage the LED. Careful attention should be paid during the soldering process and PCB assembly. In order to eliminate the stress of heat shock, please solder the LEDs no closer than 3mm from the base of the epoxy bulb.

Recommended Soldering Conditions:

|                      | Wave Soldering | Manual Solder Dipping | Hand Soldering by Iron |
|----------------------|----------------|-----------------------|------------------------|
| Pre-heat Temperature | 105°C Max      |                       |                        |
| Pre-heat Time        | 30 seconds Max |                       |                        |
| Peak Temperature     | 250°C Max      | 260°C Max             | 350°C Max              |
| Dwell Time           | 3 seconds Max  | 5 seconds Max         | 3 seconds Max          |

Packaging: 500 pcs per bulk bag



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### Reliability Test

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

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

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

(\*\*)  $I_F=20\text{mA}$  for AlInGaP chip ;  $I_F=10\text{mA}$  for InGaN 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 $\times 0.7$ **   |                    |
| Forward Voltage    | $V_F$  | $I_F=20\text{mA}$ |                       | USL $\times 1.1$ * |

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

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