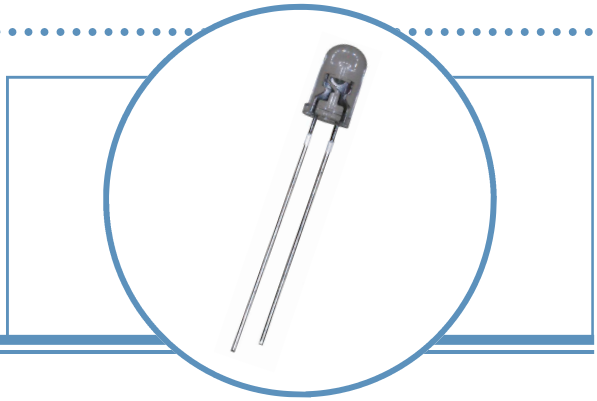
# Round Through-Hole LED Lamp (5 mm)

TT electronics
OPTEK Technology

## OVLFx3C7 Series

- High brightness with well-defined spatial radiation patterns
- UV-resistant epoxy lens
- 30° Beam Angle

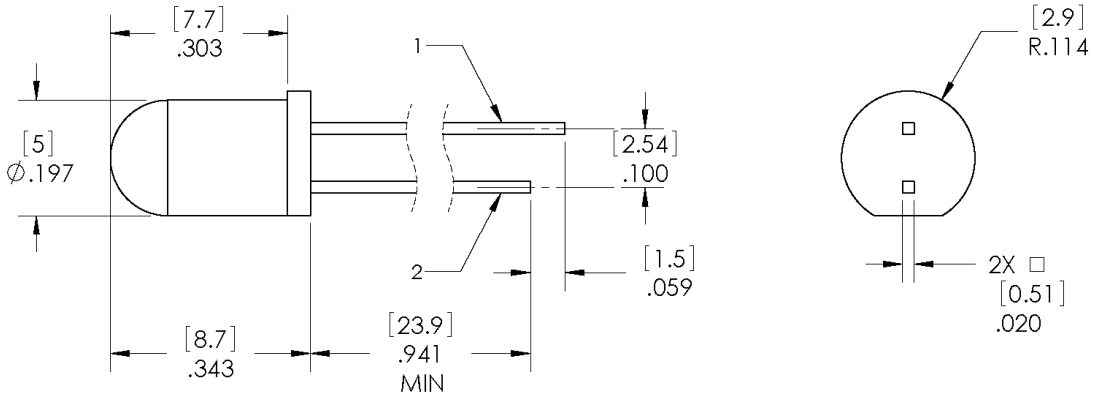


Each device in the **OVLFx3C7** series is a high-intensity LED mounted in a clear plastic T-1¾ package. The LED provides a well-defined and even emission pattern. The UV-resistant epoxy lens makes this device an optimal solution for outdoor applications.

### Applications

- Traffic and pedestrian signals
- Signage and architectural lighting
- Backlighting
- Automotive

| Part Number | Material | Emitted Color | Intensity Typ. mcd | Lens Color |
|---|---|---|---|---|
| OVLFB3C7 | InGaN | Blue | 5,200 | Clear |
| OVLFG3C7 | InGaN | Green | 16,000 | Clear |
| OVLFR3C7 | AlInGaP | Red | 7,400 | Clear |
| OVLFY3C7 | AlInGaP | Yellow | 7,400 | Clear |




1 ANODE 2 CATHODE DIMENSIONS ARE IN INCHES AND [MILLIMETERS].

RoHS

ATTENTION
OBSERVE PRECAUTIONS
ELECTROSTATIC
SENSITIVE DEVICES

Leadframe material is iron alloy with tin-plated leads

**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

$T_A$ = 25° C unless otherwise noted

| | | |
|---|---|---|
| Storage Temperature Range | | -40 ~ +100 ℃ |
| Operating Temperature Range | | -40 ~ +100 ℃ |
| Reverse Voltage | | 5 V |
| Continuous Forward Current | 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 |
| Electrostatic Discharge Classification (JEDEC-JESD22-A114F) | | Class 1C |
| LED Junction Temperature | | 125°C |
| Lead Soldering Temperature (4 mm from the base of the epoxy bulb) | | 260°C / 5 seconds |

## Electrical Characteristics

$T_A$ = 25° C unless otherwise noted

| SYMBOL | PARAMETER | COLOR | MIN | TYP | MAX | UNITS | CONDITIONS |
|---|---|---|---|---|---|---|---|
| $I_V$ | Luminous Intensity | Blue | 3,115 | 5,200 | ---- | mcd | $I_F$ = 20 mA |
| | | Green | 8,550 | 16,000 | ---- | | |
| | | Red | 4,360 | 7,400 | ---- | | |
| | | Yellow | 4,360 | 7,400 | ---- | | |
| $V_F$ | Forward Voltage | Blue | 2.6 | 3.4 | 4.0 | V | $I_F$ = 20 mA |
| | | Green | | | | | |
| | | Red | 1.8 | 2.0 | 2.4 | | |
| | | Yellow | | | | | |
| $I_R$ | Reverse Current | Blue | ---- | ---- | 10 | µA | $V_R$ = 5 V |
| | | Green | | | | | |
| | | Red | | | | | |
| | | Yellow | | | | | |
| $\lambda_D$ | Dominant Wavelength | Blue | 460 | 470 | 475 | nm | $I_F$ = 20 mA |
| | | Green | 519 | 525 | 531 | | |
| | | Red | 620 | 623 | 630 | | |
| | | Yellow | 585 | 589 | 595 | | |
| Δλ | Spectra Half Width | Blue | ---- | 25 | ---- | nm | $I_F$ = 20 mA |
| | | Green | | | | | |
| | | Red | | | | | |
| | | Yellow | | | | | |
| 2Θ½H-H | 50% Power Angle | | ---- | 30 | ---- | deg | $I_F$ = 20 mA |

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## 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: OVLFB3C7 | | |
|---|---|---|
| IV Code | Min (mcd) | Max (mcd) |
| 0V | 3,115 | 4,360 |
| 0W | 4,360 | 6,105 |
| 0X | 6,105 | 8,550 |
| 0Y | 8,550 | 11,970 |

| GREEN: OVLFG3C7 | | |
|---|---|---|
| IV Code | Min (mcd) | Max (mcd) |
| 0Y | 8,550 | 11,670 |
| 0Z | 11,970 | 16,758 |
| Z1 | 16,758 | 23,500 |
| Z2 | 23,500 | 32,800 |

### Forward Voltage ($V_F$)

| BLUE: OVLFB3C7 & GREEN: OVLFG3C7 | | |
|---|---|---|
| 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: OVLFB3C7 | | |
|---|---|---|
| Color Code | Min (nm) | Max (nm) |
| BC | 460 | 465 |
| BD | 465 | 470 |
| BE | 470 | 475 |

| GREEN: OVLFG3C7 | | |
|---|---|---|
| Color Code | Min (nm) | Max (nm) |
| FB | 519 | 523 |
| FC | 523 | 527 |
| FD | 527 | 531 |

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

| RED: OVLFR3C7 | | |
|---|---|---|
| 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 |

| YELLOW: OVLFY3C7 | | |
|---|---|---|
| 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 ($V_F$)

| RED: OVLFR3C7 & YELLOW: OVLFY3C7 | | |
|---|---|---|
| VF Code | Min | Max |
| A | 1.8 | 2.0 |
| B | 2.0 | 2.2 |
| C | 2.2 | 2.4 |

### Dominant Wavelength (nm)

| RED: OVLFR3C7 | | |
|---|---|---|
| Color Code | Min (nm) | Max (nm) |
| RA | 620 | 625 |
| RB | 625 | 630 |

| YELLOW: OVLFY3C7 | | |
|---|---|---|
| Color Code | Min (nm) | Max (nm) |
| YC | 585 | 587 |
| YD | 587 | 589 |
| YE | 589 | 591 |
| YF | 591 | 593 |
| YG | 593 | 595 |

## Typical Electro-Optical Characteristics Curves (BLUE)

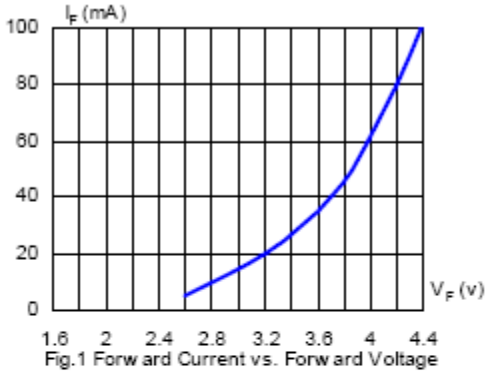

Fig.1 Forward Current vs. Forward Voltage

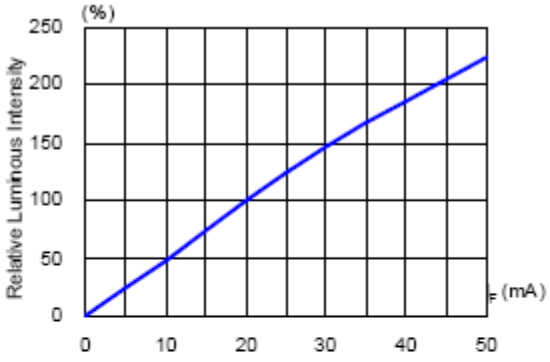

Fig.2 Luminous Intensity vs. Forward Current

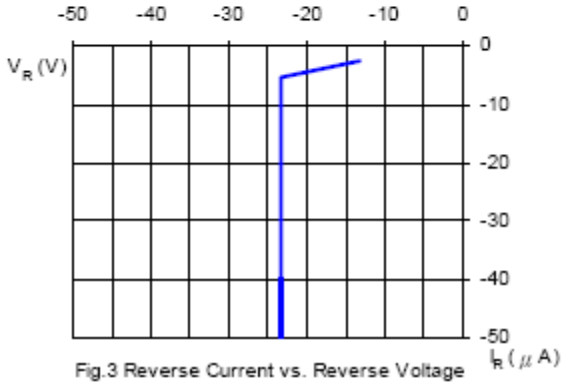

Fig.3 Reverse Current vs. Reverse Voltage

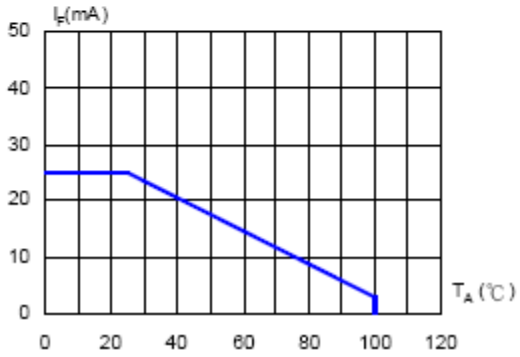

Fig.4 Allowable Forward Current vs. Ambient Temperature

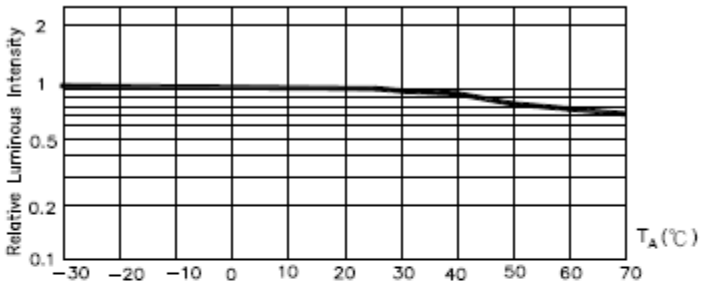

Fig.5 Luminous Intensity at $I_F$ =20mA vs. Ambient Temperature

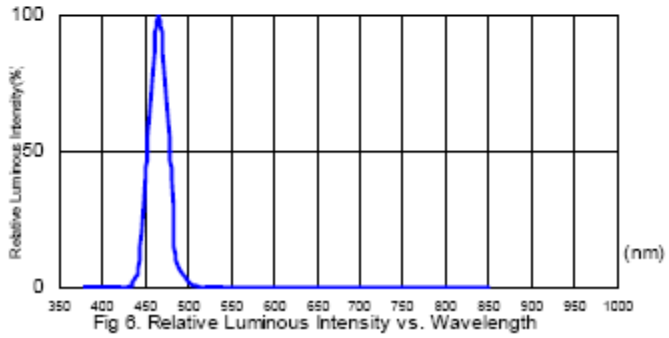

Fig 6. Relative Luminous Intensity vs. Wavelength




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## Typical Electro-Optical Characteristics Curves (GREEN)

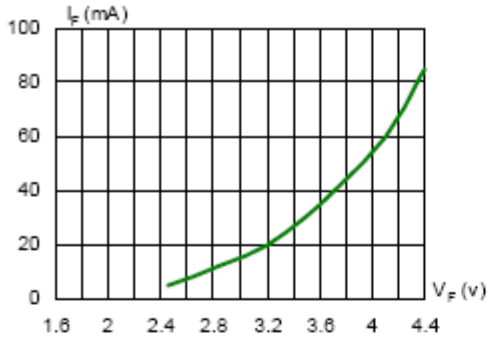

Fig.1 Forward Current vs. Forward Voltage

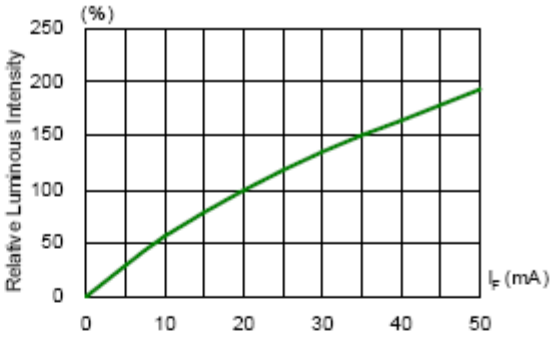

Fig.2 Luminous Intensity vs. Forward Current

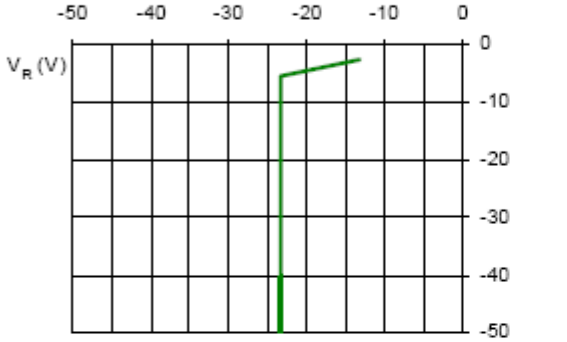

Fig.3 Reverse Current vs. Reverse Voltage

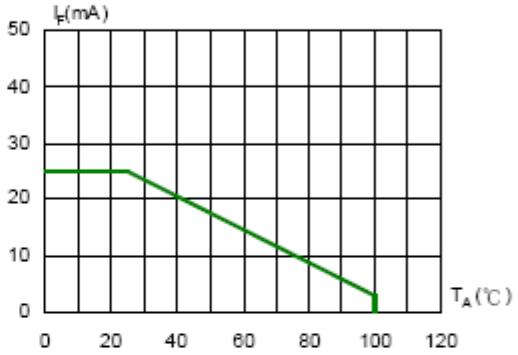

Fig.4 Allowable Forward Current vs. Ambient Temperature

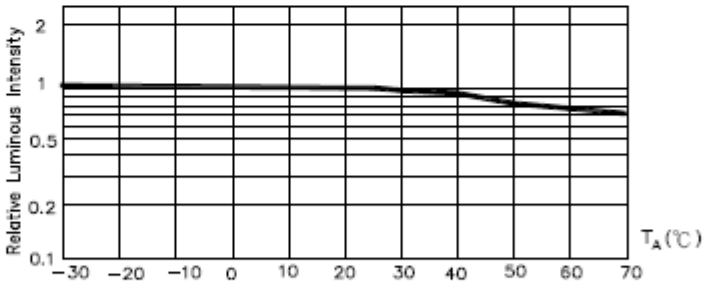

Fig.5 Luminous Intensity at $I_F$ =20mA vs. Ambient Temperature

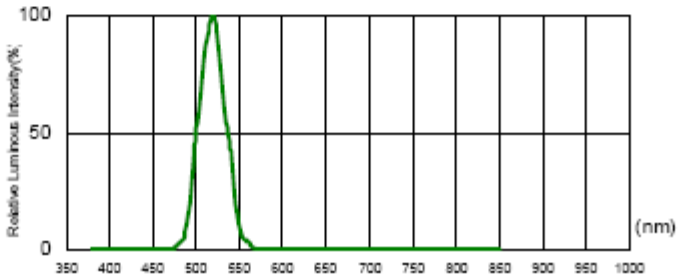

Fig 6. Relative Luminous Intensity vs. Wavelength

## Typical Electro-Optical Characteristics Curves (RED)

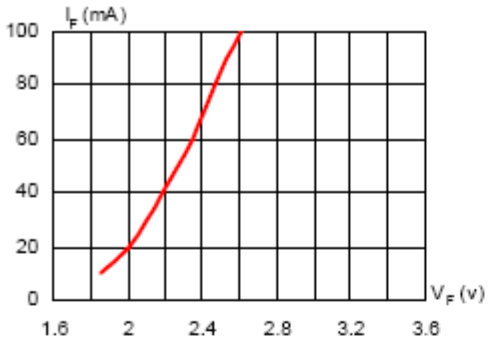


Fig.1 Forward Current vs. Forward Voltage

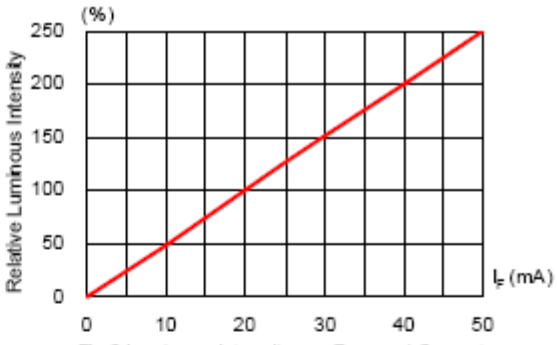


Fig.2 Luminous Intensity vs. Forward Current

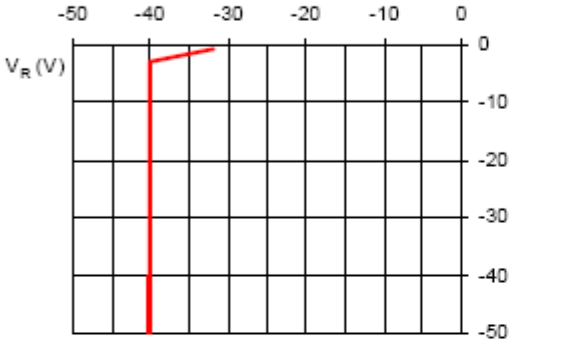


Fig.3 Reverse Current vs. Reverse Voltage

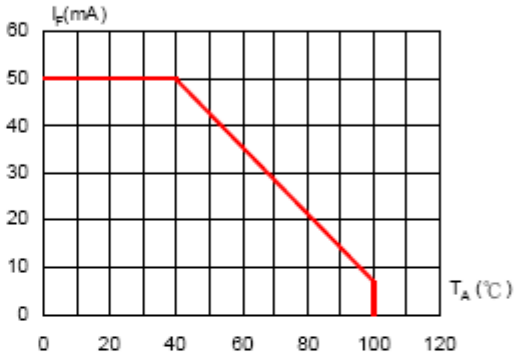


Fig.4 Allowable Forward Current vs. Ambient Temperature

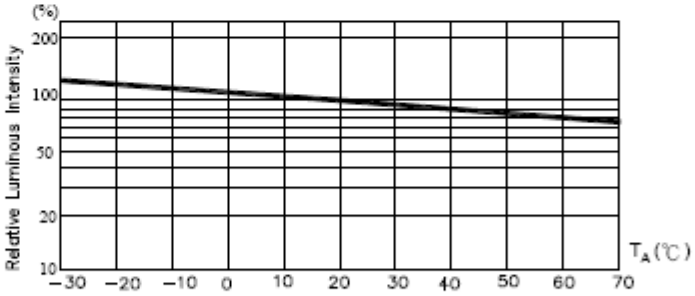


Fig.5 Luminous Intensity at $I_F$ =20mA vs. Ambient Temperature

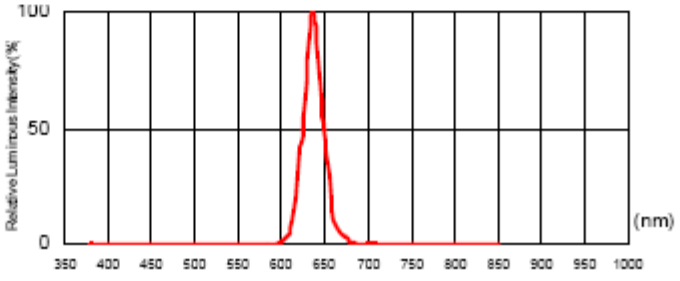


Fig 6. Relative Luminous Intensity vs. Wavelength




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## Typical Electro-Optical Characteristics Curves (YELLOW)

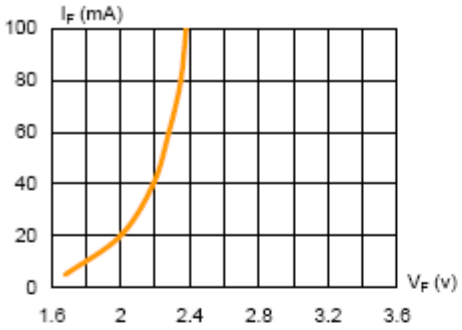


Fig.1 Forward Current vs. Forward Voltage

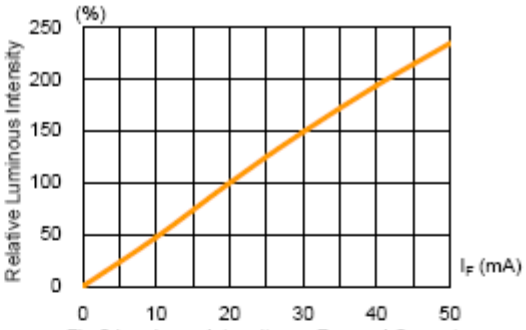


Fig.2 Luminous Intensity vs. Forward Current

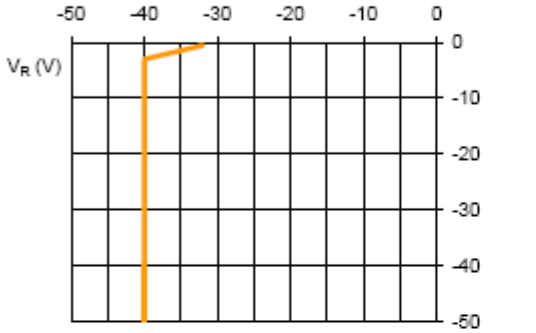


Fig.3 Reverse Current vs. Reverse Voltage

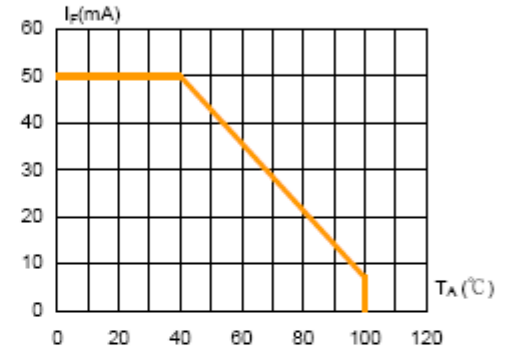


Fig.4 Allowable Forward Current vs. Ambient Temperature

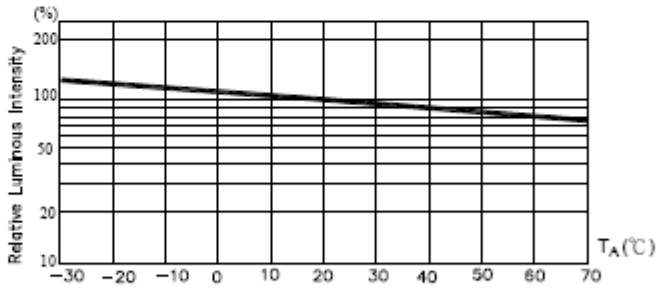


Fig.5 Luminous Intensity at $I_F$ =20mA vs. Ambient Temperature

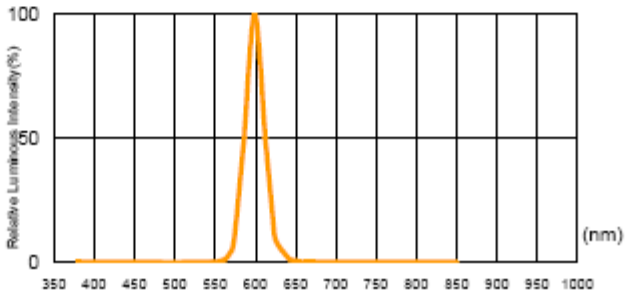
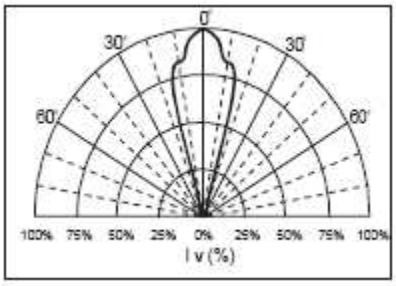


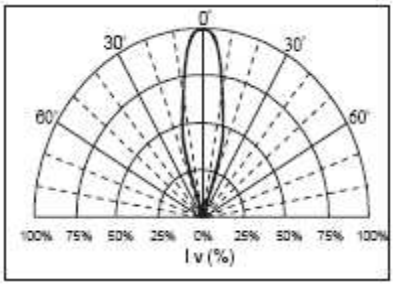
Fig 6. Relative Luminous Intensity vs. Wavelength

## Beam Pattern

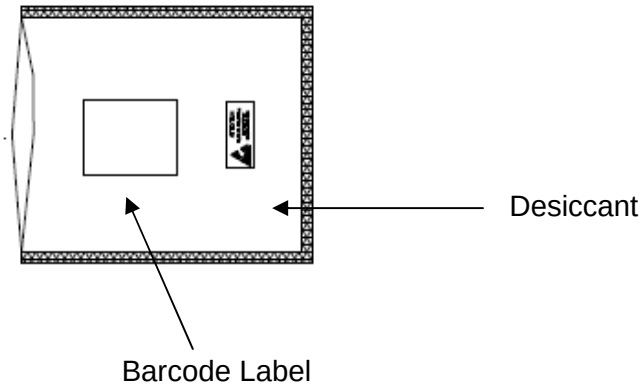
(RED) and (YELLOW)




(BLUE) and (GREEN)




Packaging: 500 pcs per bulk bag with desiccant







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## Reliability Test

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

| Classi-fication | 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℃ , $I_F$ =30mA * | 1000 Hrs | 100 | 0 / 1 | Pass |
| Environment Test | High Temperature Storage (HTS) | MIL-STD-750D Method 1032.1 | $T_A$=100℃ | 1000 Hrs | 100 | 0 / 1 | Pass |
| | Low Temperature Storage (LTS) | MIL-STD-750D Method 1032.1 | $T_A$=－40℃ | 1000 Hrs | 100 | 0 / 1 | Pass |
| | Temp. & Humidity with Bias (THB) | MIL-STD-750D Method 103B | $T_A$=85℃ , Rh=85% $I_F$ =20mA ** | 500 Hrs | 100 | 0 / 1 | Pass |
| | Thermal Shock Test (TST) | MIL-STD-750D Method 1056.1 | 0℃ ~ 100℃<br>2min 2min | 100 cycles | 100 | 0 / 1 | Pass |
| | Temperature Cycling Test (TCT) | MIL-STD-750D Method 1051.5 | -40℃ ~ 25℃ ~ 100℃ ~ 25℃<br>30min 5min 30min 5min | 100 cycles | 100 | 0 / 1 | Pass |
| Mechanical Test | Solderability | MIL-STD-750D Method 2026.4 | 235±5℃ , 5 sec | 1 time | 20 | 0 / 1 | Pass |
| | Resistance to Soldering Heat | MIL-STD-750D Method 2031.1 | 260±5℃ , 10 sec | 1 time | 20 | 0 / 1 | Pass |
| | Lead Integrity | MIL-STD-750D Method 2036.3 | Load 2.5N (0.25kgf)<br>0°~ 90°~ 0° , bend | 3 times | 20 | 0 / 1 | Pass |

Remark：(*) $I_F$ =30mA for AlInGaP chip；$I_F$ =20mA for InGaN chip

(**) $I_F$ =20mA for AlInGaP chip；$I_F$ =10mA for InGaN chip

**2. Failure Criteria ($T_A$ =25℃):**

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

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

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