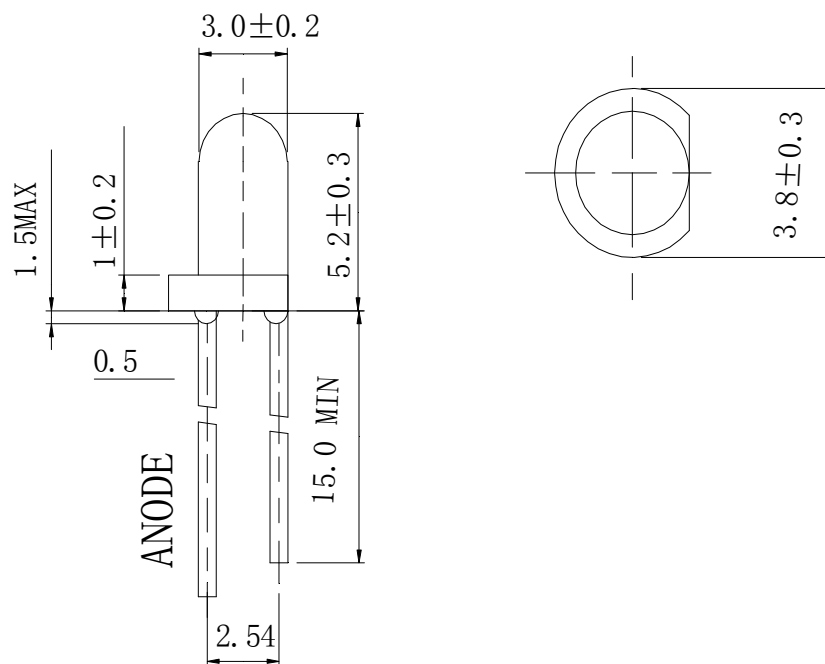


Features

- 3mm DIA LED Lamp
- Low Power Consumption
- High Efficiency
- Various Colors and Viewing Angle
- Long Solid State Reliability
- Package: 1000pcs/Packing

Applications

- Indicator

Package Dimensions**Notes:**

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.01") unless otherwise noted.
3. Protruded Resin under flange is 1.0mm(0.04") max.
4. Specifications are subject to change without notice.



Selection Guide

| | | | |
|-----------------------|-------------|-------|---------------|
| Part No | Lens Type | Dice | Emitted Color |
| FDL-3521HW-ZWCSHL-A45 | Water Clear | InGaN | White |

Electrical / Optical Characteristics At Ta=25°C

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|-----------|--------------------------|------|-------|------|------|----------------|
| Iv | Luminous Intensity | 1000 | - | | mcd | IF=20mA |
| 2θ1/2 | Viewing Angle | | 60 | | deg | |
| x | Chromaticity Coordinates | | 0.285 | | nm | IF=20mA |
| y | | | 0.27 | | | |
| VF | Forward Voltage | 2.8 | 3.3 | 3.6 | V | IF=20mA |
| IR | Reverse Current | | | 50 | μ A | VR 5V |

Note:

1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 optical centerline value
2. The chromaticity coordinates(x,y) is derived form 1931 CIE chromaticity diagram.
3. The chromaticity coordinates(x,y) guarantee should be added±0.02 tolerance.

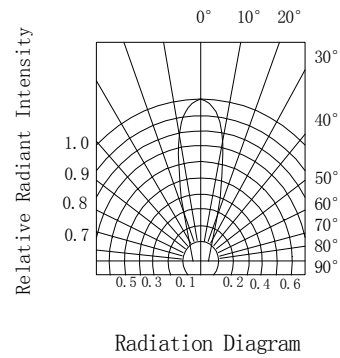
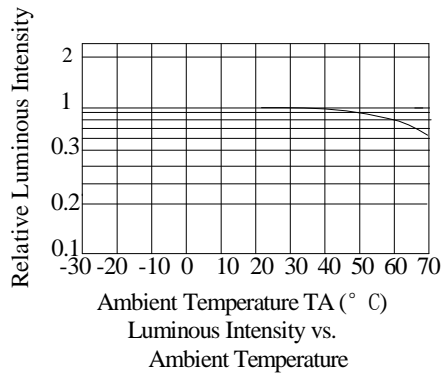
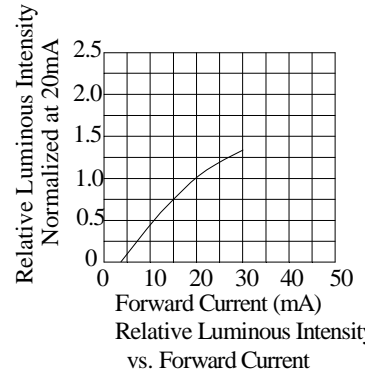
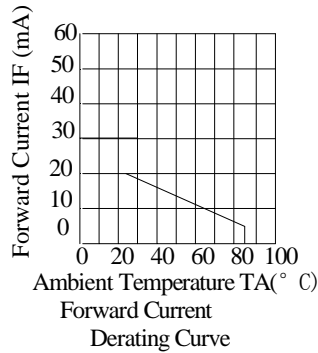
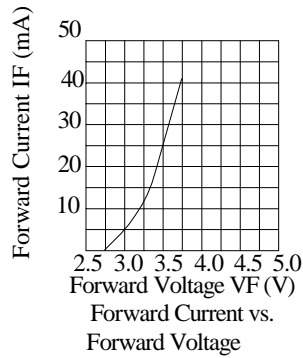
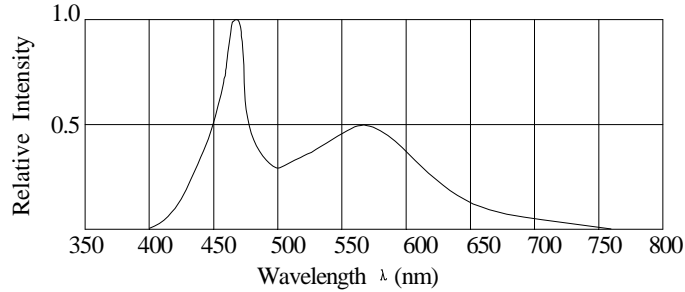
Absolute Maximum Ratings At Ta=25°C

| Parameter | White | Unit |
|--|---------------------|-------|
| Power Dissipation | 70 | mW |
| Peak Forward Current | 100 | mA |
| Continuous Forward Current | 20 | mA |
| Dreading Linear From25°C | 0.25 | mA/°C |
| Reverse Voltage | 5 | V |
| Electrostatic Discharge Threshold(HBM) | 300 | V |
| Operating Temperature Range | -20°C to + 80°C | |
| Storage Temperature Range | -55°C to + 85°C | |
| Soldering Condition | 260°C For 5 Seconds | |

Note:

1. 1/10DutyCycle,0.1msPulseWidth

Electrical Optical Characteristics Curves At Ta=25°C



Notes:

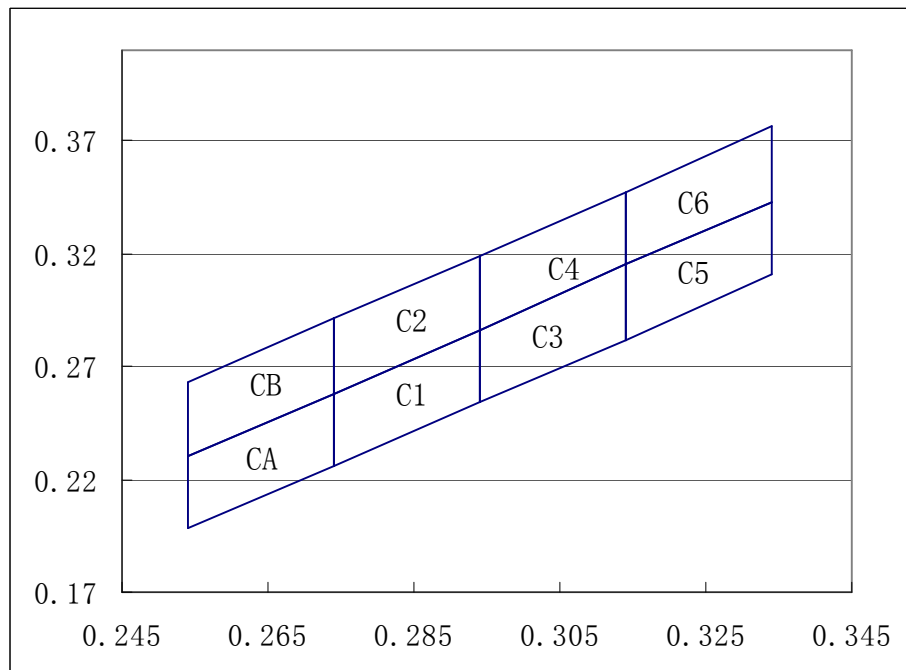
1. The LEDs should be used within a year.
2. The LEDs should be kept in 5~30°C and 60% RH for less.
3. The LEDs should be used within 24 hours, or else should be kept a 5~30°C and 30% RH or less. And LEDs should be used within 7 days after opening the package.



Chromaticity Coordinates Specifications for Bin Grading (+/-0.02) IF=20mA

| | | | | | | | | | | | |
|----|-------|-------|----|-------|-------|----|-------|-------|----|-------|-------|
| CA | 0.254 | 0.23 | CB | 0.254 | 0.198 | C1 | 0.274 | 0.226 | C2 | 0.274 | 0.258 |
| | 0.254 | 0.263 | | 0.254 | 0.23 | | 0.274 | 0.258 | | 0.274 | 0.291 |
| | 0.274 | 0.291 | | 0.274 | 0.258 | | 0.294 | 0.286 | | 0.294 | 0.319 |
| | 0.274 | 0.258 | | 0.274 | 0.226 | | 0.294 | 0.254 | | 0.294 | 0.286 |
| | 0.254 | 0.23 | | 0.254 | 0.198 | | 0.274 | 0.226 | | 0.274 | 0.258 |
| C3 | 0.294 | 0.254 | C4 | 0.294 | 0.286 | C5 | 0.314 | 0.282 | C6 | 0.314 | 0.315 |
| | 0.294 | 0.286 | | 0.294 | 0.319 | | 0.314 | 0.315 | | 0.314 | 0.347 |
| | 0.314 | 0.315 | | 0.314 | 0.347 | | 0.334 | 0.343 | | 0.334 | 0.376 |
| | 0.314 | 0.282 | | 0.314 | 0.315 | | 0.334 | 0.311 | | 0.334 | 0.343 |
| | 0.294 | 0.254 | | 0.294 | 0.286 | | 0.314 | 0.282 | | 0.314 | 0.315 |

CIE Chromaticity Diagram



Reliability Test Items Conditions

| Classification | Test Item | Test Conditions | Test hours | Result |
|--------------------|-----------------------------------|---|------------|--------|
| Endurance Test | Operation Life | Connect with a power $I_F=20mA$ T_a =Under room temperature | 1000Hrs | 0/20 |
| | High Temperature High Humidity | $T_a=+65^{\circ}C \pm 5^{\circ}C$ RH=90%-95% | 240Hrs | 0/20 |
| | High Temperature Storage | High $T_a=+85^{\circ}C \pm 5^{\circ}C$ | 1000Hrs | 0/20 |
| | Low Temperature Storage | Low $T_a=-35^{\circ}C \pm 5^{\circ}C$ Test time=1000hrs | 1000Hrs | 0/20 |
| Environmental Test | Temperature Cycling | $-45^{\circ}C \sim +105^{\circ}C$ 15min 5min 15min | 300 Cycles | 0/20 |
| | Thermal Shock | $-35^{\circ}C \sim \pm 5^{\circ}C \sim +85^{\circ}C \sim \pm 5^{\circ}C$ 5min 10sec 5min | 300 Cycles | 0/20 |
| | Solder Resistance | Preheating: $120^{\circ}C - 150^{\circ}C$, within 2 minutes. Operation heating : $260^{\circ}C$ (Max.), within 5 seconds (Max.) | 5Cycles | 0/20 |

Judgment criteria of failure for the reliability

| Measuring items | Symbol | Measuring conditions | Judgment criteria for failure |
|--------------------|--------------|----------------------|-------------------------------|
| Forward voltage | $V_F(V)$ | $I_F=20mA$ | Over $U \times 1.2$ |
| Reverse current | $I_R(\mu A)$ | $V_R=5V$ | Over $U \times 2$ |
| Luminous intensity | $I_v(mcd)$ | $I_F=20mA$ | Below $S \times 0.5$ |

Note: 1.U means the upper limit of specified characteristics. S means initial value.
2.Measurement shall be taken between 2 hours after the test pieces have been returned to normal ambient conditions after completion of each test.