

Part Number: WP7113SEC/J3-AMT

Hyper Red

Features

- High reliability LED package.
- Low power consumption.
- Popular T-1 3/4 diameter package.
- General purpose leads.
- Reliable and rugged.
- Long life - solid state reliability.
- Available on tape and reel.
- RoHS compliant.

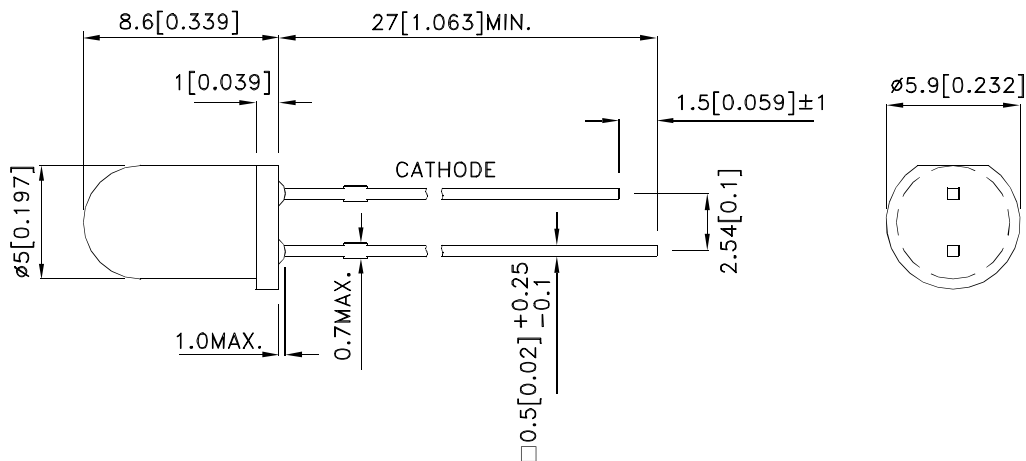
Description

The Hyper Red device is based on light emitting diode chip made from AlGaInP.

Applications

- Traffic signaling.
- Backlighting (illuminated advertising , general lighting).
- Interior and exterior automotive lighting.
- Substitution of micro incandescent lamps.
- Reading lamps.
- Signal and symbol luminaire for orientation.
- Marker lights (e.g. Steps, exit ways, etc).
- Decorative and entertainment lighting.
- Indoor and outdoor commercial and residential architectural lighting.

Package Dimensions



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25 (0.01")$ unless otherwise noted.
3. Lead spacing is measured where the leads emerge from the package.
4. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.



Selection Guide

| Part No. | Dice | Lens Type | Iv (mcd) [2] @ 20mA | | | Viewing Angle [1] |
|------------------|---------------------|-------------|------------------------|-------|-------|----------------------|
| | | | Code. | Min. | Max. | 2θ1/2 |
| WP7113SEC/J3-AMT | Hyper Red (AlGaInP) | Water Clear | ZG | 8000 | 9000 | 20° |
| | | | ZH | 9000 | 11000 | |
| | | | ZM | 11000 | 14000 | |
| | | | ZN | 14000 | 18000 | |
| | | | *ZD | *5000 | *6000 | |
| | | | *ZE | *6000 | *7000 | |
| | | | *ZF | *7000 | *8000 | |

Notes:

1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.
2. Luminous intensity/ luminous Flux: +/-15%.
- *Luminous intensity value is traceable to the CIE127-2007 compliant national standards.

Electrical / Optical Characteristics at TA=25°C

| Parameter | Symbol | Value | Unit |
|---|---------|---------------------|------|
| Power dissipation | Pd | 140 | mW |
| Reverse Voltage | VR | 5 | V |
| Junction temperature | TJ | 120 | °C |
| Operating Temperature | Top | -40 To +100 | °C |
| Storage Temperature | Tstg | -40 To +120 | °C |
| DC Forward Current[1] | IF | 50 | mA |
| Peak Forward Current [2] | IFM | 150 | mA |
| Electrostatic Discharge Threshold (HBM) | | 3000 | V |
| Thermal Resistance (Junction/ambient) [1] | Rth j-a | 350 | °C/W |
| Lead Solder Temperature [3] | | 260°C For 3 Seconds | |
| Lead Solder Temperature [4] | | 260°C For 5 Seconds | |

Notes:

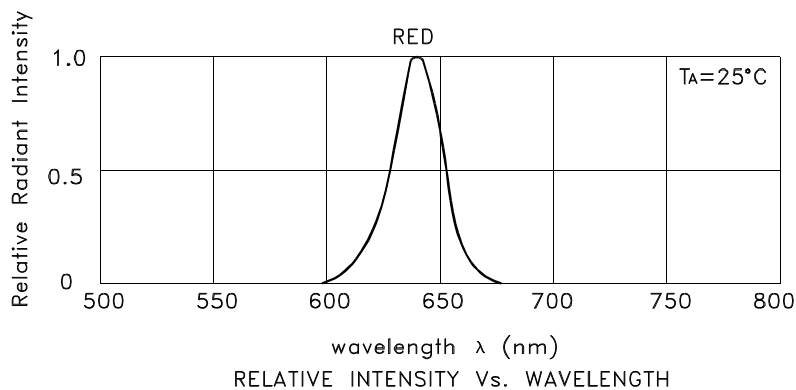
1. Rth(j-a) Results from mounting on PC board FR4 (pad size≥16 mm² per pad),
2. 1/10 Duty Cycle, 0.1ms Pulse Width.
3. 2mm below package base.
4. 5mm below package base.

Electrical / Optical Characteristics at Ta=25°C

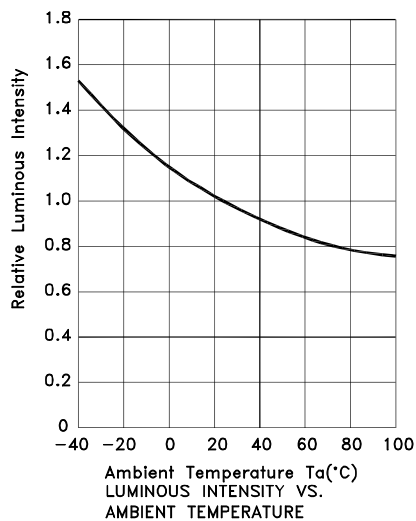
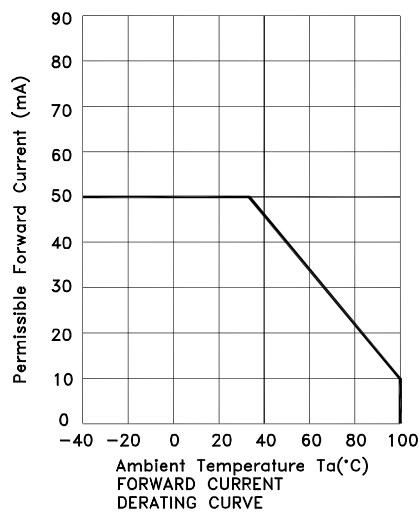
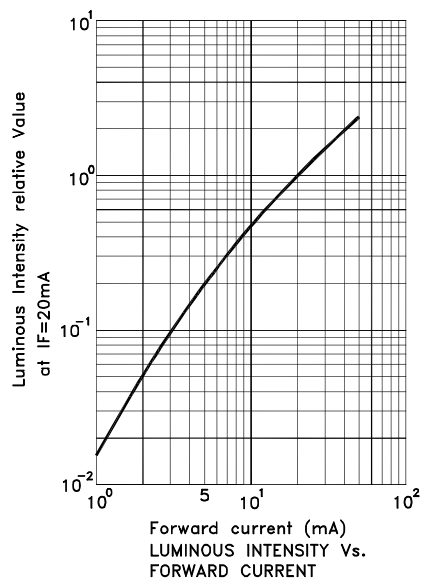
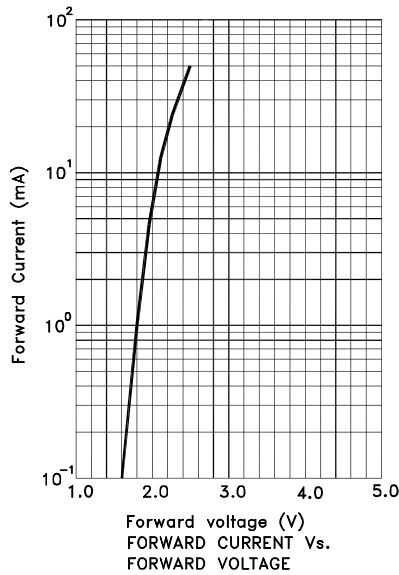
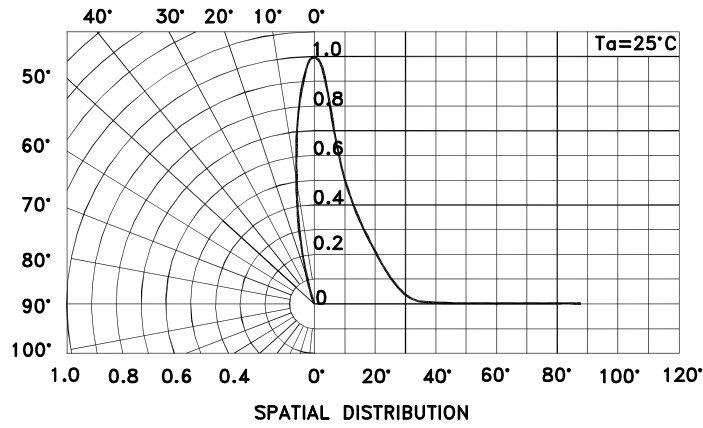
| Parameter | Symbol | Value | Unit |
|---|---------------------|-------|---------------|
| Wavelength at peak emission If=20mA [Typ.] | λ peak | 640 | nm |
| Dominant Wavelength If=20mA [Min.] | λ dom [1] | 620 | nm |
| Dominant Wavelength If=20mA [Max.] | λ dom [1] | 630 | nm |
| Spectral bandwidth at 50% $\Phi_{REL MAX}$ If=20mA [Typ.] | $\Delta\lambda$ | 25 | nm |
| Forward Voltage If=20mA [Min.] | V_F [2] | 1.8 | V |
| Forward Voltage If=20mA [Typ.] | | 2.2 | |
| Forward Voltage If=20mA [Max.] | | 2.8 | |
| Reverse Current ($V_R = 5V$) [Max.] | I_R | 10 | μA |
| Temperature coefficient of λ peak If=20mA, $-10^\circ C \leq T \leq 100^\circ C$ | $TC_{\lambda peak}$ | 0.14 | $nm/^\circ C$ |
| Temperature coefficient of λ dom If=20mA, $-10^\circ C \leq T \leq 100^\circ C$ | $TC_{\lambda dom}$ | 0.04 | $nm/^\circ C$ |
| Temperature coefficient of V_F If=20mA, $-10^\circ C \leq T \leq 100^\circ C$ | TC_V | -2.0 | $mV/^\circ C$ |

Notes:

1. The dominant Wavelength (λ_d) above is the setup value of the sorting machine. (Tolerance $\lambda_d : \pm 1nm.$)
2. Forward Voltage: $\pm 0.1V$.
3. Wavelength value is traceable to the CIE127-2007 compliant national standards.

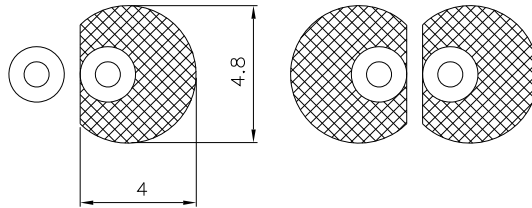


Hyper Red WP7113SEC/J3-AMT



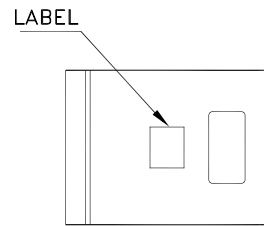
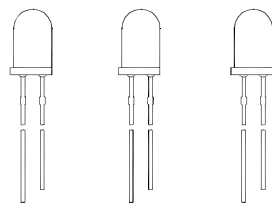
Kingbright

Recommended Soldering Pattern
(Units : mm; Tolerance: ± 0.1)

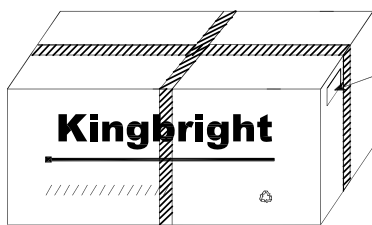


PACKING & LABEL SPECIFICATIONS

WP7113SEC/J3-AMT



500PCS / BAG

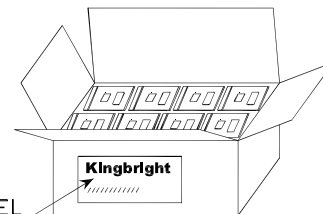


20K / 9# BOX


OUTSIDE LABEL



OUTSIDE LABEL



10K / 5# BOX

| | | |
|--|------|----------------------|
| <h1>Kingbright</h1> | | |
| P/NO: WP7113xxx | | |
| QTY: 500 pcs | Q.C. | Q C |
| S/N: XXXX | | xx xx XXXX PASSED |
| CODE: XXX | | |
| LOT NO: | | |
|  xxxxxxxxxxxxxxxxxxxxxxxxxxxx | | |
| RoHS Compliant | | |

PRECAUTIONS

1. The lead pitch of the LED must match the pitch of the mounting holes on the PCB during component placement. Lead-forming may be required to insure the lead pitch matches the hole pitch. Refer to the figure below for proper lead forming procedures. (Fig. 1)

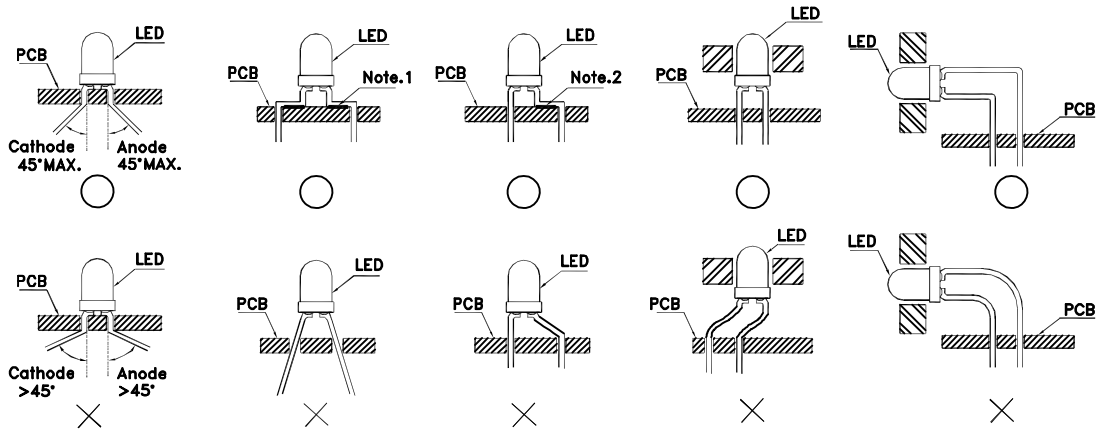


Fig.1

”O” Correct mounting method ”X” Incorrect mounting method

2. When soldering wire to the LED, use individual heat-shrink tubing to insulate the exposed leads to prevent accidental contact short-circuit. (Fig.2)
3. Use stand-offs (Fig.3) or spacers (Fig.4) to securely position the LED above the PCB.

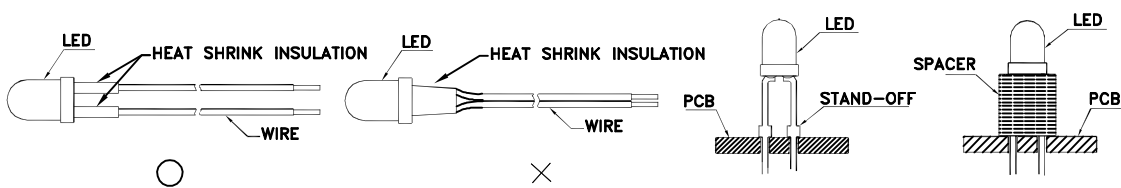


Fig. 2

Fig. 3

Fig. 4

4. Maintain a minimum of 2mm clearance between the base of the LED lens and the first lead bend. (Fig. 5 and 6)
5. During lead forming, use tools or jigs to hold the leads securely so that the bending force will not be transmitted to the LED lens and its internal structures. Do not perform lead forming once the component has been mounted onto the PCB. (Fig. 7)

6. Do not bend the leads more than twice. (Fig. 8)

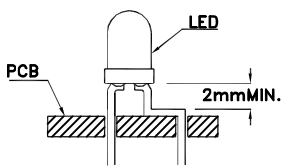


Fig. 5

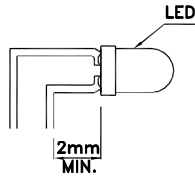


Fig. 6

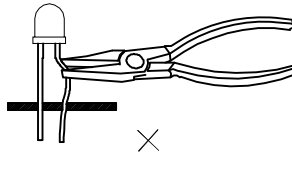


Fig. 7

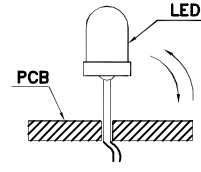
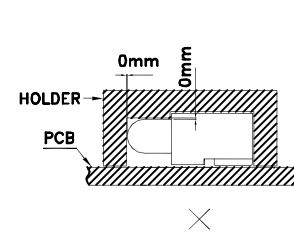
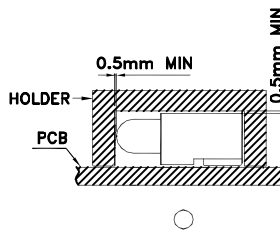
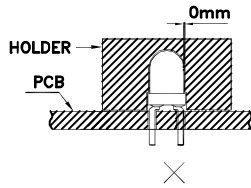
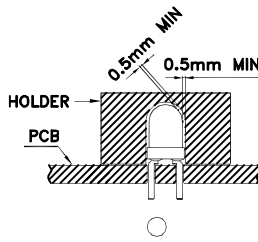


Fig. 8

7. During soldering, component covers and holders should leave clearance to avoid placing damaging stress on the LED during soldering.

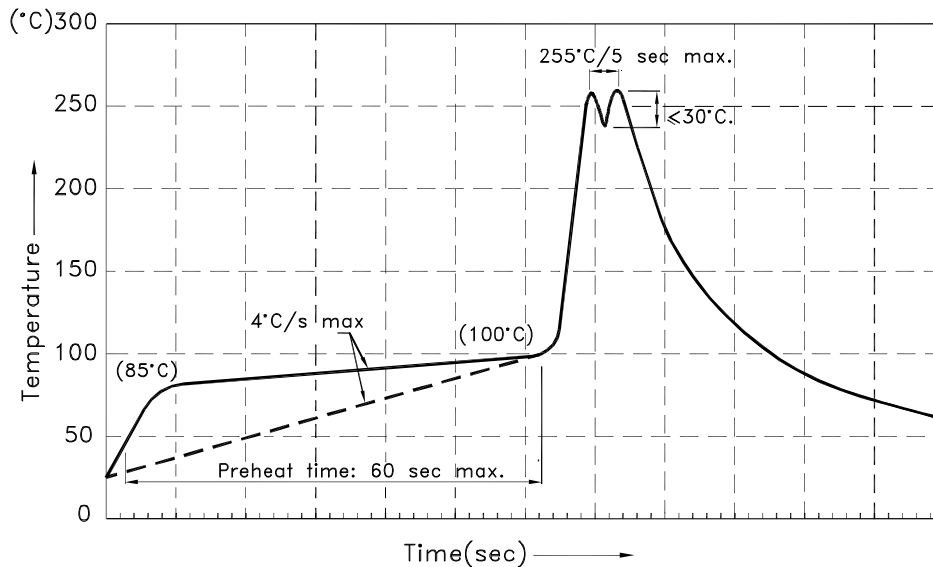


8. The tip of the soldering iron should never touch the lens epoxy.

9. Through-hole LEDs are incompatible with reflow soldering.

10. If the LED will undergo multiple soldering passes or face other processes where the part may be subjected to intense heat, please check with Kingbright for compatibility.

11. Recommended Wave Soldering Profiles:



Notes:

1. Recommend pre-heat temperature of 105°C or less (as measured with a thermocouple attached to the LED pins) prior to immersion in the solder wave with a maximum solder bath temperature of 260°C
2. Peak wave soldering temperature between 245°C ~ 255°C for 3 sec (5 sec max).
3. Do not apply stress to the epoxy resin while the temperature is above 85°C.
4. Fixtures should not incur stress on the component when mounting and during soldering process.
5. SAC 305 solder alloy is recommended.
6. No more than one wave soldering pass.

Reliability Test Items And Conditions

The reliability of products shall be satisfied with items listed below

Lot Tolerance Percent Defective (LTPD) : 10%

| No. | Test Item | Standards | Test Condition | Test Times / Cycles | Number of Damaged |
|-----|--------------------------------------|-----------------------|--|---------------------|-------------------|
| 1 | Continuous operating test | - | Ta = 25°C ,IF = maximum rated current* | 1,000 h | 0 / 22 |
| 2 | High Temp. operating test | EIAJ ED-4701/100(101) | Ta = 100°C IF = maximum rated current* | 1,000 h | 0 / 22 |
| 3 | Low Temp. operating test | - | Ta = -40°C, IF = maximum rated current* | 1,000 h | 0 / 22 |
| 4 | High temp. storage test | EIAJ ED-4701/100(201) | Ta = maximum rated storage temperature | 1,000 h | 0 / 22 |
| 5 | Low temp. storage test | EIAJ ED-4701/100(202) | Ta = -40°C | 1,000 h | 0 / 22 |
| 6 | High temp. & humidity storage test | EIAJ ED-4701/100(103) | Ta = 60°C, RH = 90% | 1,000 h | 0 / 22 |
| 7 | High temp. & humidity operating test | EIAJ ED-4701/100(102) | Ta = 60°C, RH = 90% IF = maximum rated current* | 1,000 h | 0 / 22 |
| 8 | Resistance to Soldering Heat | EIAJ ED-4701/100(302) | TSld=260±5°C, 10 sec | 1 time | 0 / 18 |
| 9 | Thermal shock operating test | - | Ta = -40°C(15min) ~ 100°C(15min) IF = derated current at 100°C | 500 cycles | 0 / 22 |
| 10 | Thermal shock test | - | Ta = -40°C(15min) ~ maximum rated storage temperature(15min) | 500 cycles | 0 / 22 |
| 11 | Electric Static Discharge (ESD) | EIAJ ED-4701/100(304) | C = 100pF , R2 = 1.5KΩ V = 3000V | Once each Polarity | 0 / 22 |
| 12 | Vibration test | - | a = 196m/s ² , f = 100~2KHz , t = 48min for all xyz axes | 4 times | 0 / 22 |

* : Refer to forward current vs. derating curve diagram

Failure Criteria

| Items | Symbols | Conditions | Failure Criteria |
|-------------------------|---------|------------------------------------|--|
| luminous Intensity | Iv | IF = 20mA | Testing Min. Value <Spec.Min.Value x 0.5 |
| Forward Voltage | VF | IF = 20mA | Testing Max. Value ≥Spec.Max.Value x 1.2 |
| Reverse Current | IR | VR = Maximum Rated Reverse Voltage | Testing Max. Value ≥Spec.Max.Value x 2.5 |
| High temp. storage test | - | - | Occurrence of notable decoloration, deformation and cracking |

All design applications should refer to Kingbright application notes available at <http://www.KingbrightUSA.com/ApplicationNotes>