

Part Number: WP7113SURCK-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.

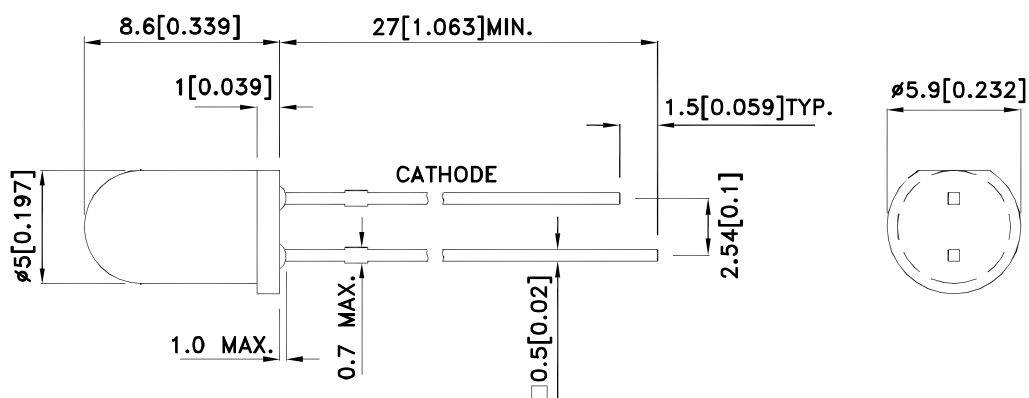
### Description

The Hyper Red source color devices are made with Al-GaInP on GaAs substrate Light Emitting Diode.

### 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
WP7113SURCK-AMT	Hyper Red (AlGaInP)	Water Clear	ZB	3600	4200	20°
			ZC	4200	5000	
			ZD	5000	6000	
			ZE	6000	7000	
			ZF	7000	8000	
			*U	*1000	*1300	
			*V	*1300	*1600	
			*W	*1600	*1900	
			*X	*1900	*2300	

**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.

## Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Value	Unit
Power dissipation	Pd	125	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	185	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 mm<sup>2</sup> 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

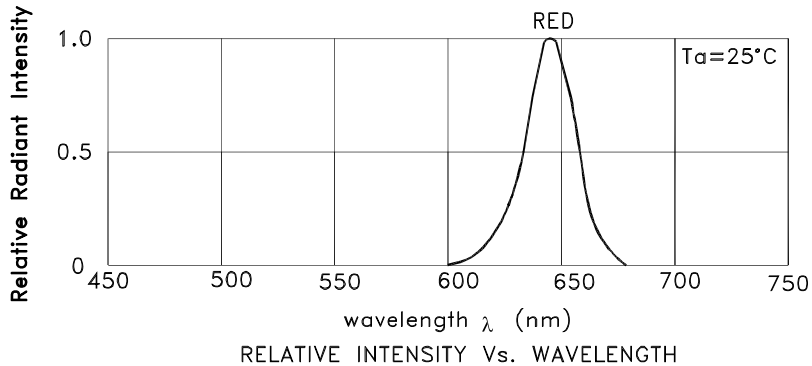
Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Wavelength at peak emission IF=20mA	$\lambda$ peak		650   *645		nm
Dominant Wavelength IF=20mA	$\lambda$ dom [1]	620		640	nm
Spectral bandwidth at 50% $\Phi$ REL MAX IF=20mA	$\Delta\lambda$		28		nm
Forward Voltage IF=20mA	V <sub>F</sub> [2]	1.6	1.95	2.5	V
Reverse Current (V <sub>R</sub> = 5V)	I <sub>R</sub>			10	uA
Temperature coefficient of $\lambda$ peak IF=20mA, -10 ° C ≤ T ≤ 100 ° C	TC $\lambda$ peak		0.14		nm/° C
Temperature coefficient of $\lambda$ dom IF=20mA, -10 ° C ≤ T ≤ 100 ° C	TC $\lambda$ dom		0.05		nm/° C
Temperature coefficient of V <sub>F</sub> IF=20mA, -10 ° C ≤ T ≤ 100 ° C	TC <sub>V</sub>		-1.8		mV/° C

Notes:

1. The dominant Wavelength ( $\lambda$  d) above is the setup value of the sorting machine. (Tolerance  $\lambda$  d : ±1nm. )

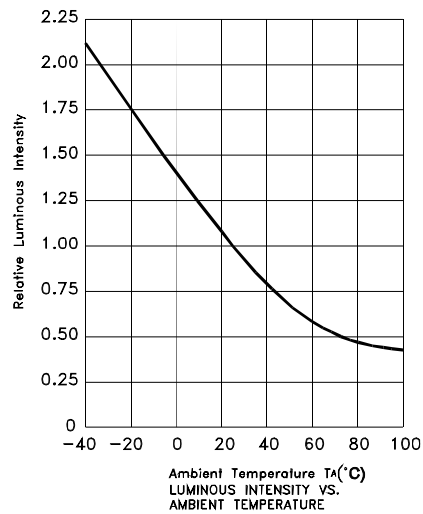
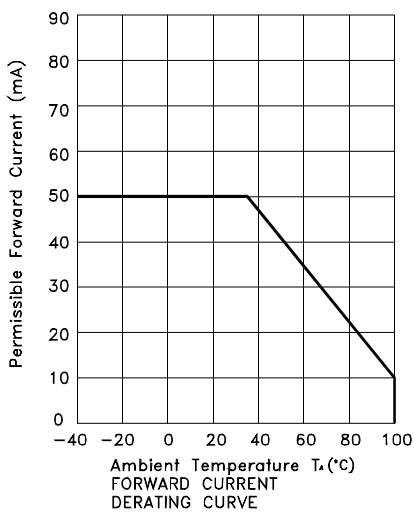
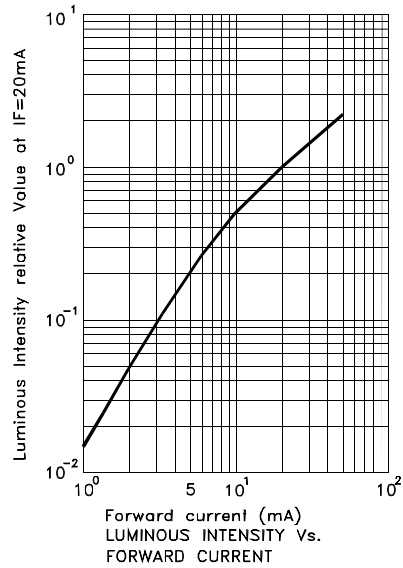
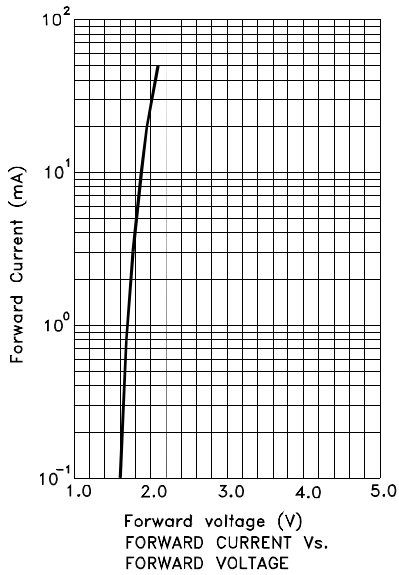
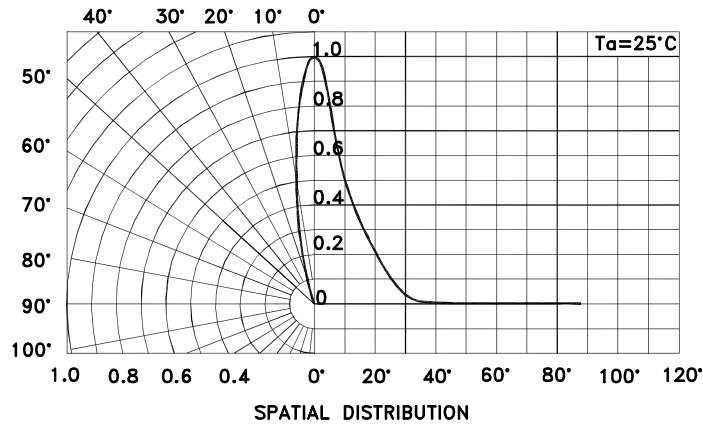
2. Forward Voltage: +/-0.1V.

\* Wavelength value is traceable to the CIE127-2007 compliant national standards.



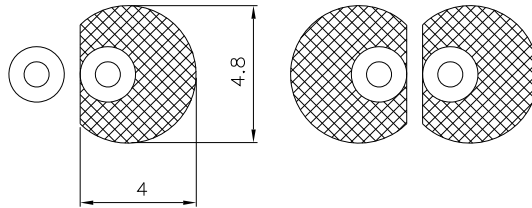
## Hyper Red

## WP7113SURCK-AMT



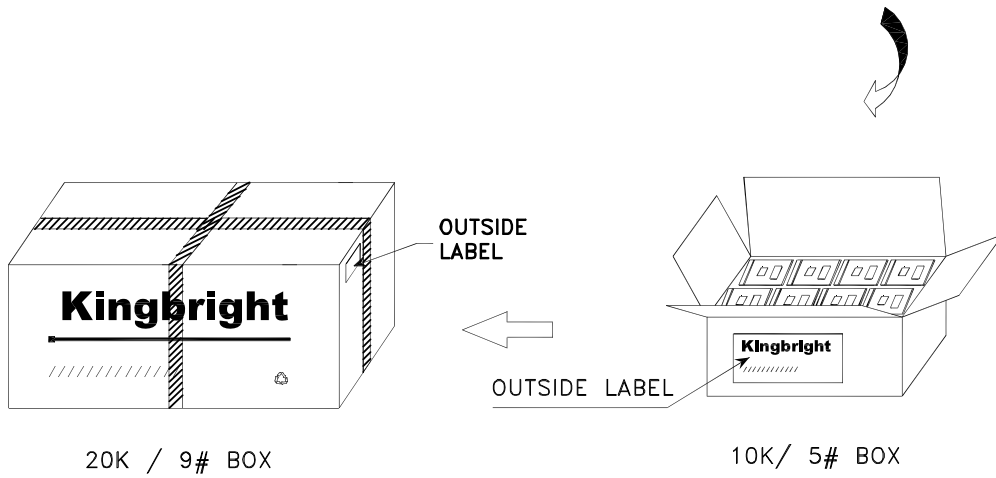
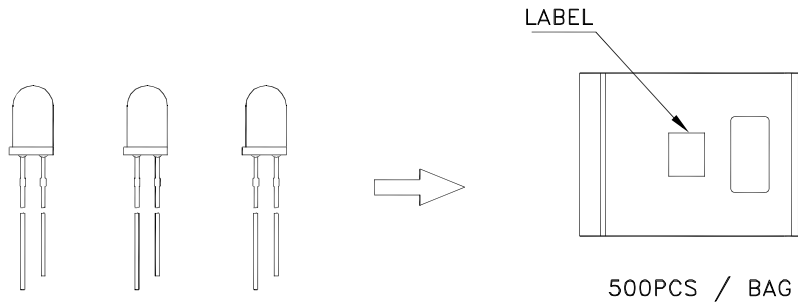
# Kingbright

**Recommended Soldering Pattern**  
(Units : mm; Tolerance:  $\pm 0.1$ )



**PACKING & LABEL SPECIFICATIONS**

**WP7113SURCK-AMT**



<b>Kingbright</b>					
P/NO: WP7113xxx					
QTY: 500 pcs	Q.C.	<table border="1"> <tr> <td>Q C</td> </tr> <tr> <td>xx xx xxxx</td> </tr> <tr> <td>PASSED</td> </tr> </table>	Q C	xx xx xxxx	PASSED
Q C					
xx xx xxxx					
PASSED					
S/N: XXXX					
CODE: XXX					
LOT NO:					
 <small>XXXXXXXXXXXXXXXXXXXXXXXXXXXX</small>					
RoHS Compliant					

## 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	Soldering reliability test	EIAJ ED-4701/100(301)	Moisture soak : 30°C,70% RH, 72h Preheat : 150~180°C(120s max.) Soldering temp : 260°C(10s)	2 times	0 / 18
9	Thermal shock operating test	-	Ta = -40°C(15min) ~ 100°C(15min) IF = derated current at 100°C	1,000 cycles	0 / 22
10	Thermal shock test	-	Ta = -40°C(15min) ~ maximum rated storage temperature(15min)	1,000 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 <sup>2</sup> , 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

## 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)

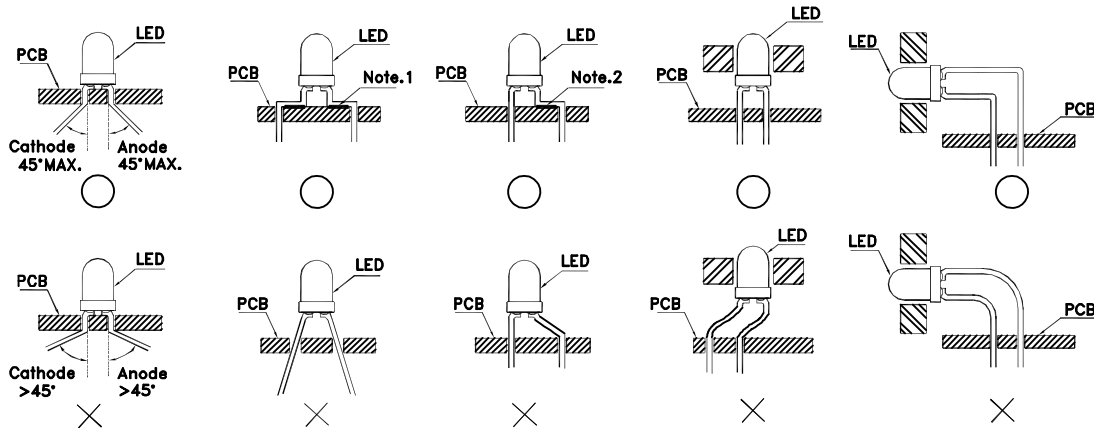


Fig.1

”○” Correct mounting method ”×” 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.

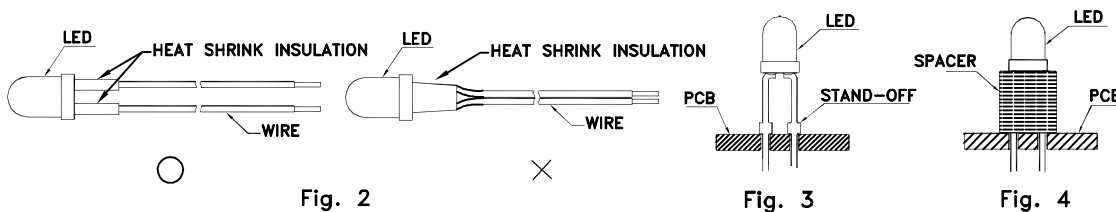


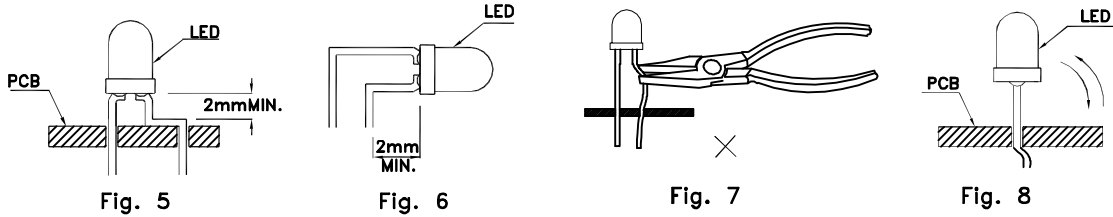
Fig. 2

Fig. 3

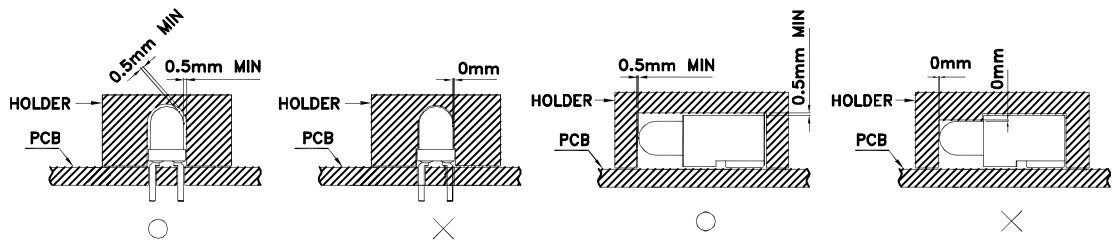
Fig. 4

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)



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

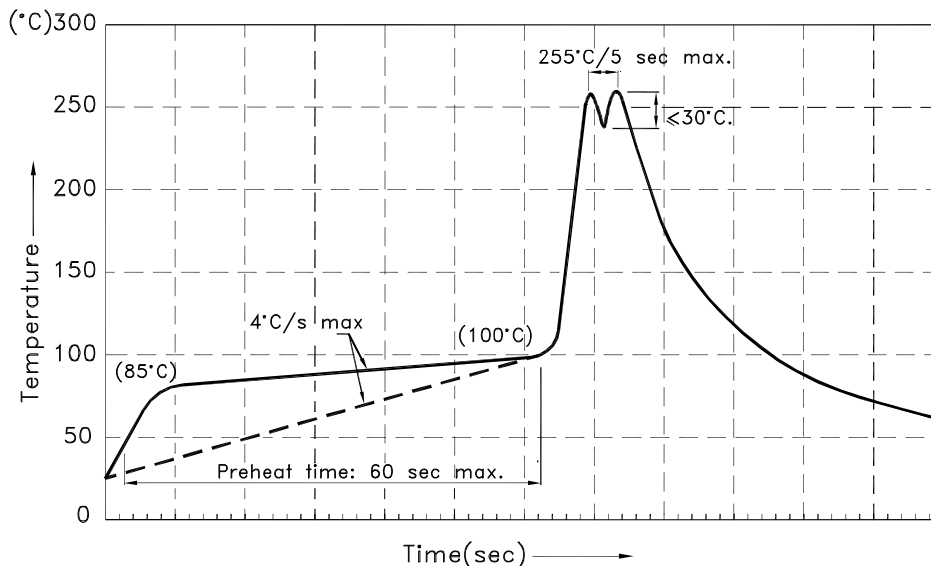


8. The tip of the soldering iron should never touch the lens epoxy.

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.