

**MODEL: 3528R1C-KPC-K**

### Features

- PLCC-2 package.
- White package.
- Wide viewing angle.
- Computable with automatic placement equipment.
- Pb-free



### Descriptions

• The 3528 series has wide viewing angle and optimized light coupling by inter reflector. This feature makes TOP LED ideal for light pipe application. The low current requirement makes this device ideal for portable equipment or any other application where power is at a premium.

### Usage Notes:

- Surge will damage the LED
- When using LED, it must use a protective resistor in series with DC current about 20mA

### Applications

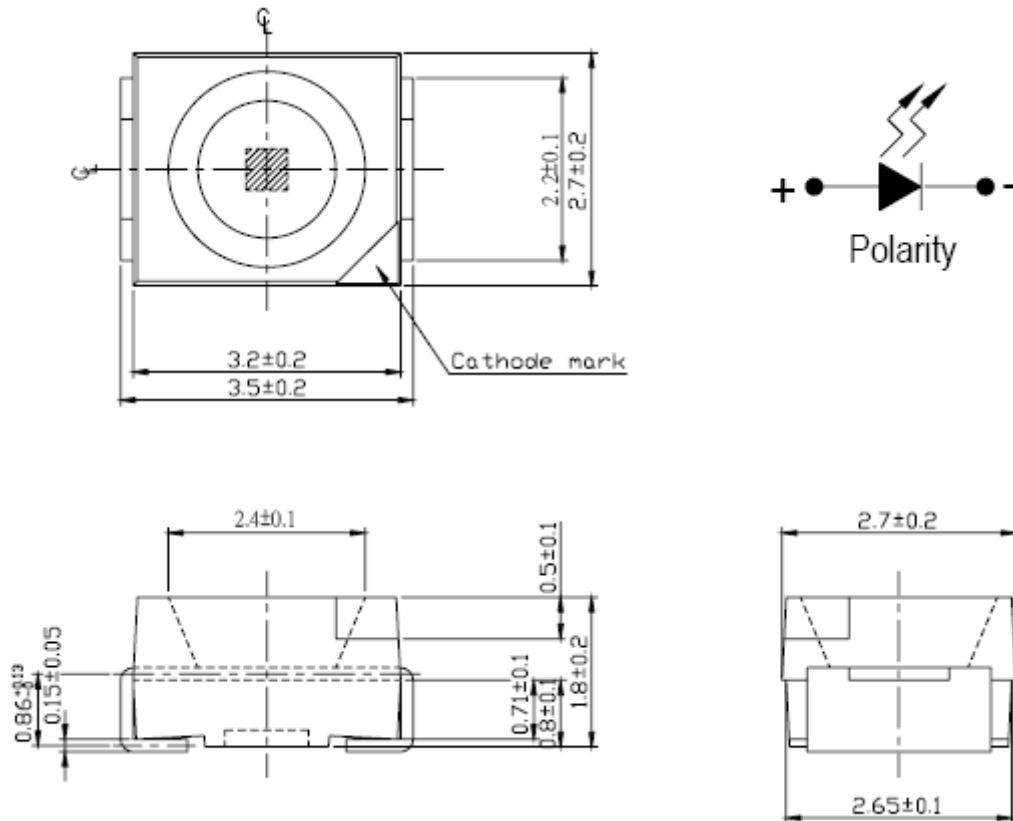
- Automotive: backlighting in dashboard and switch.
- Telecommunication: indicator and backlighting in telephone and fax.
- Flat backlight for LCD, switch and symbol.
- Light pipe application.
- General use.

### Device Selection Guide

LED Part No.	Chip		Lens Color
	Material	Emitted Color	
3528R1C-KPC-K	AlGaInP	Red	Water clear

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### Package Dimensions



### Notes:

- Other dimensions are in millimeters, tolerance is 0.25mm except being specified.
- Protruded resin under flange is 1.5mm Max LED.
- Bare copper alloy is exposed at tie-bar portion after cutting.

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**Absolute Maximum Rating (T<sub>a</sub>=25°C)**

Parameter	Symbol	Absolute Maximum Rating	Unit
Peak Forward Current (Duty 1/10 @1KHz)	I <sub>F</sub>	60	mA
Forward Current	I <sub>FM</sub>	25	mA
Reverse Voltage	V <sub>R</sub>	5	V
Power Dissipation	P <sub>D</sub>	60	mW
Operating Temperature	T <sub>opr</sub>	-40~+80	°C
Storage Temperature	T <sub>stg</sub>	-40~+100	°C
Soldering Temperature	T <sub>sol</sub>	Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

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### Electro-Optical Characteristics (T<sub>a</sub>=25°C)

Parameter	Symbol	*Chip Rank	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	I <sub>v</sub>	K	150	---	250	mcd	IF=20mA (Note1)
Viewing Angle	2θ <sub>1/2</sub>	---	---	120	---	Deg	(Note 2)
Peak Emission Wavelength	λ <sub>p</sub>	---	620	---	635	nm	IF=20mA
Spectral Line Half-Width	Δλ	---	---	20	---	nm	IF=20mA
Forward Voltage	V <sub>F</sub>	---	1.9	---	2.3	V	IF=20mA
Reverse Current	I <sub>R</sub>	---	---	---	10	μA	VR=5V

\*3528R1C-K-X



### Note:

- Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- θ<sub>1/2</sub> is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

#### Reliability Test Items And Conditions

No	Item	Test Condition	Sample Number	Criteria for Judging	Ac/Re
1	Solder ability	$T=235 \pm 5^{\circ}\text{C}$ $T=5\text{sec.}$	15	Good wetting	0/1
2	Soldering heat	$T=260 \pm 5^{\circ}\text{C}$ $T=10\text{sec.}$	15	$IV \geq \text{LSL}^*$ $VF \leq \text{USL}^*$ $IR \leq \text{USL}$	0/1
3	Rapid change of temperature followed by: damp heat, cyclic	L: $-40^{\circ}\text{C}$ 10min (2~3) min H: $+100^{\circ}\text{C}$ 10min 5cycle $T = (25 \sim 55)^{\circ}\text{C}$ RH: (90~95) % 2cycle 48h recovery time 2h	11	$IV \geq \text{LSL}$ $VF \leq \text{USL}$ $IR \leq \text{USL}$	0/1
4	Damp heat, cyclic	$T = (25 \sim 55)^{\circ}\text{C}$ RH: (90~95) % 6 cycle 144h recovery time 2h	11	$IV \geq 0.7\text{LSL}$ $VF \leq 1.1\text{USL}$ $IR \leq 2\text{USL}$	0/1
5	Electrical endurance	$I_F = 30\text{mA}$ $T = 1000\text{h}$	22	$IV \geq 0.7\text{LSL}$ $VF \leq 1.1\text{USL}$ $IR \leq 2\text{USL}$	0/1
6	Storage at high temperature	$T_{\text{stg}} = 100 \pm 2^{\circ}\text{C}$ $t = 1000\text{h}$	15	$IV \geq \text{LSL}$ $VF \leq \text{USL}$ $IR \leq \text{USL}$	0/1
7	Terminal strength	Tensile: $W=5\text{N}$ $t=30\text{s}$ <b>Bending: <math>W=2.5\text{N}</math> 2times</b>	15	No damage	0/1

\*U.S.L.: Upper Standard Level

\* L.S.L.: Lower Standard Level

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### APPLICATION NOTES:

#### 1) Soldering:

##### ① Manual soldering by soldering iron:

The use of a soldering iron of less than 25W is recommended and the temperature of the iron must be kept at no higher than 300°C.

##### ② Reflow soldering:

a. The temperature profile as shown in Fig. 3 is recommended for soldering SMD LED by the reflow furnace.

b. Care must be taken that the products be handled after their temperature has dropped down to the normal room temperature after soldering.

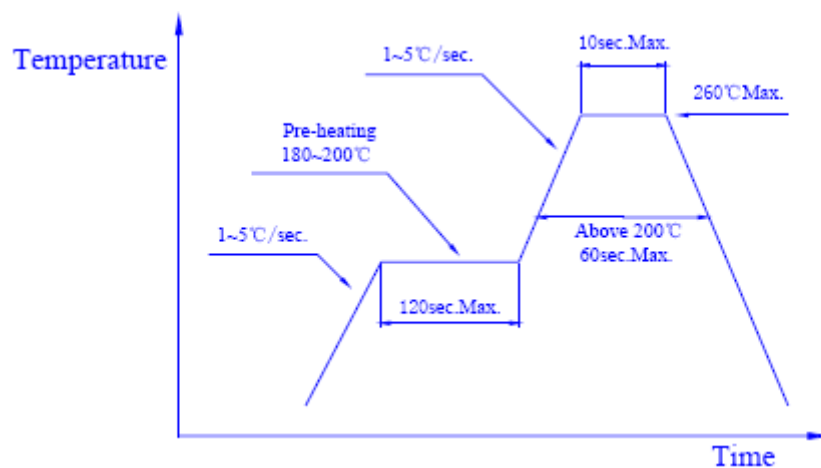


Fig.3

#### 2) Post solder cleaning:

When cleaning after soldering is needed, the following conditions must be adhered to.



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- ① Cleaning solvents: Freon TF or equivalent or alcohol.
- ② Temperature: 50°C Max. for 30 seconds or 30°C Max. for 3 minutes
- ③ Ultrasonic: 300W Max.
- 3) OTHERS:
  - a. Care must be taken not to cause stress to the epoxy resin portion of SMD LED while it is exposed to the high temperature.
  - b. Care must be taken not to rub the epoxy resin portion of SMD LED with a hard or sharp edged article such as the sand blast and the metal hook as the epoxy resin is rather soft and liable to be damaged.