

3528 SMD Chip LED

Red and Yellow

**RoHS
Compliant**



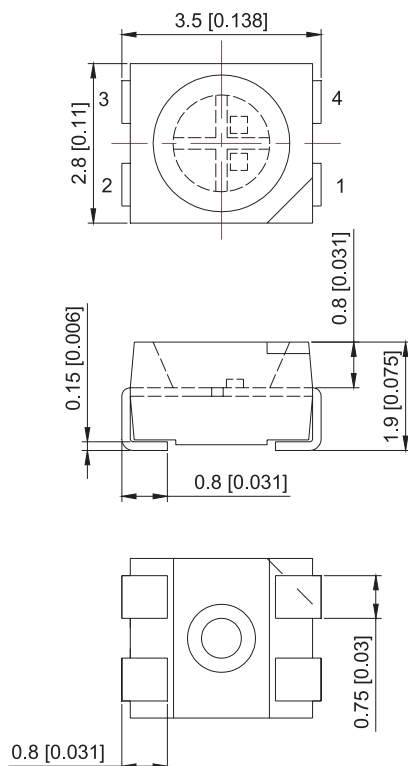
Features

- Dimensions: 3.5mm × 2.8mm × 1.9mm
- Wide Viewing Angle.

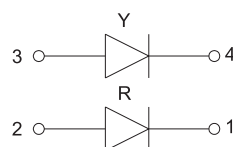
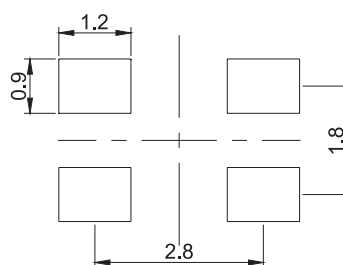
Applications

- Automotive: backlighting in dashboard and switch.
- Telecommunication: indicator and Back-lighting in telephone and fax.
- Flat backlight for LCD switch and symbol.

Package Dimensions



Recommended soldering pattern



Dimensions : Millimetres

Notes

1. All dimensions are in millimeters.
2. Tolerance is ± 0.25 unless otherwise noted.
3. Specifications are subject to change without notice.

Device Selection Guide

Part No.	Chip		Lens Colour
	Material	Emitted Colour	
	(InGaAlP)	Red Yellow	

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Absolute Maximum Ratings at TA=25°C

Parameter	Symbol	Red	Yellow	Unit
Power Dissipation	P _D	62		mW
Forward Current	I _F	25		mA
Peak Forward Current*1	I _{FP}	100		mA
Reverse Voltage	V _R	5		V
Operating Temperature	T _{opr}	-40°C To +85°C		
Storage Temperature	T _{stg}	-40°C To +85°C		

Notes:

*1: Pulse width≤0.1ms, Duty cycle≤1/10

Optical / Electrical Characteristics at TA=25°C

Parameter	Symbol	Device	Min.	Typ.	Max	Unit	Test Conditions
Forward Voltage	V _F	Red Yellow	1.8 1.8	—	2.6 2.6	V	I _F =20mA
Reverse Current	I _R		—	—	10	μA	V _R =5V
Dominant Wavelength	λ _D		617 586	—	629 594	nm	I _F =20mA
Luminous Intensity	I _v		225 295	—	500 650	mcd	
Viewing Angle	2θ1/2		—	120	—	Deg.	

Remarks:

If special sorting is required (e.g. binning based on forward voltage, luminous intensity, or dominant wavelength), the typical accuracy of the sorting process is as follows:

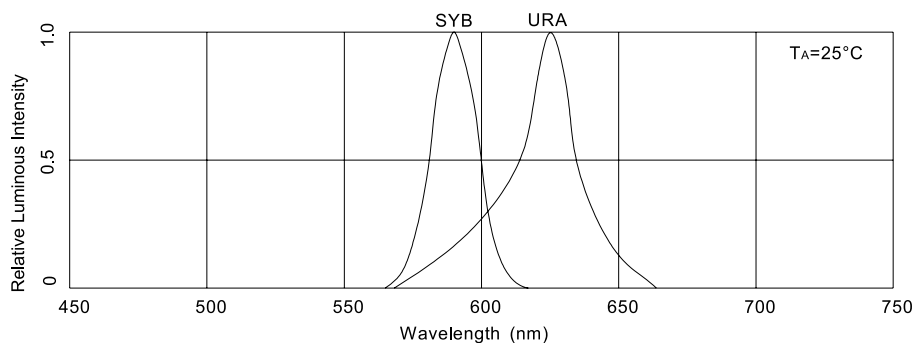
1. Wavelength: ±1nm
2. Luminous Intensity: ±15%
3. Forward Voltage: ±0.1V

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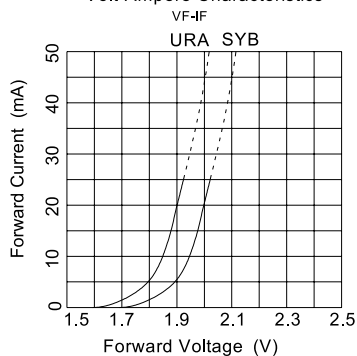
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Typical Electrical/Optical Characteristics Curves

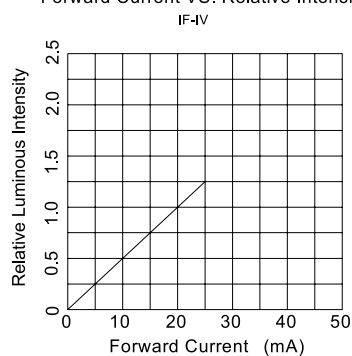
Relative Spectral Distribution



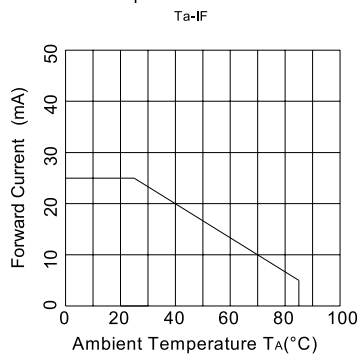
Volt-Ampere Characteristics



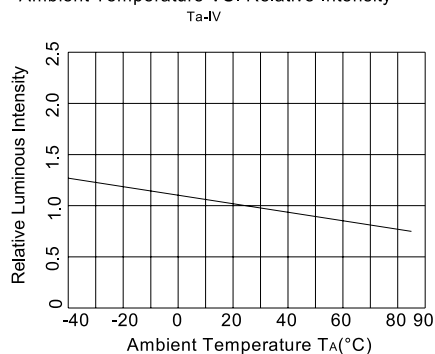
Forward Current VS. Relative Intensity



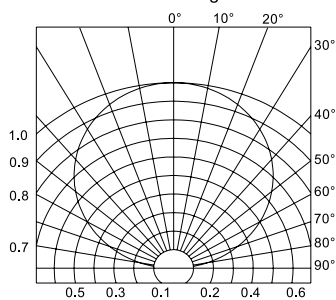
Ambient Temperature VS. Forward Current



Ambient Temperature VS. Relative Intensity



Radiation Diagram



Dimensions : Millimetres

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Reliability Test Items and Conditions

Test Item	Reference	Test Conditions	Time	Quantity	Criterion
Thermal Shock	JIS-C7021 A-4	100°C±5°C 15min ↓↑ -40°C±5°C 15min	200cycles	22	0/22
High Temperature Storage	JEITA ED- 4701 200 201	Ta=100°C	1000h		
Low Temperature Storage	JEITA ED- 4701 200 202	Ta=-40°C			
High Temperature High Humidity Storage	JIS-C7021 B-11	Ta=85, RH=85%			
Resistance to Soldering Heat	GB/T 4937	Tsol*=(260±5)°C 10secs.	2 times		
Life Test	JESD22-A108	Ta=25°C±5°C IF=20mA	1000h		
High Temperature Life Test		Ts=55°C±5°C IF=20mA			

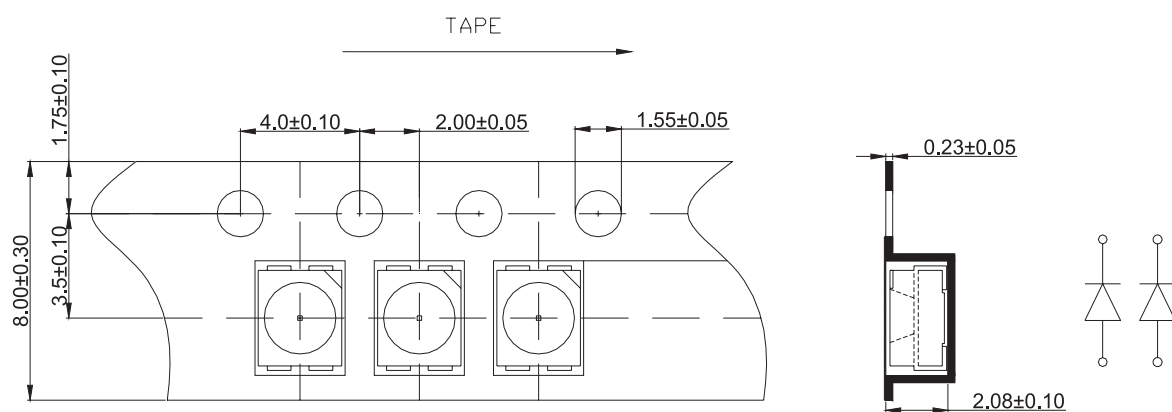
Criteria for Judging the Damage

Item	Symbol	Test Condition	Failure Criteria	
			MIN.	MAX.
Forward Voltage	VF (V)	IF=20mA	---	U.S.L*1.1
Reverse Current	IR (uA)	VR=5V	---	10uA
Luminous Flux	IV (LM)	IF=20mA	L.S.L*0.7	---

Note:1.USL:Upper Specification Level

2.LSL:Lower Specification Level

Tape specifications



Dimensions : Millimetres

Hand Soldering

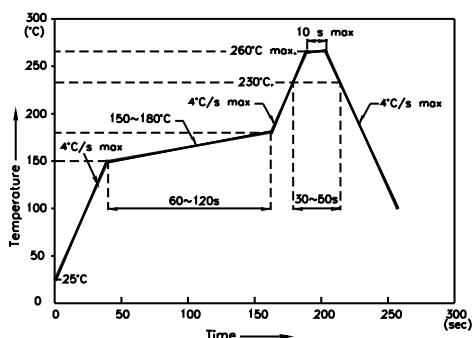
A soldering iron of less than 20W is recommended to be used in Hand Soldering, Please keep the temperature of the soldering iron under 360°C while soldering. Each terminal of the LED is to go for less than 3 second and for one time only. Be careful because the damage of the product is often started at the time of the hand soldering.

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Soldering Profile

Reflow Soldering Profile For Lead-free SMT Process.



Notes

1. We recommend the reflow temperature 245°C. ($\pm 5^{\circ}\text{C}$) The maximum soldering temperature should be limited to 260°C.
2. Don't cause stress to epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED.

The following procedures may decrease the possibility of ESD damage.

- All production machinery and test instruments must be electrically grounded.
- Use a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- Maintain a humidity level of 50% or higher in production areas.
- Use anti-static packaging for transport and storage.

Cleaning

- Led should be cleaned in a normal temperature and the time for cleaning should be less than 3 minutes; please use Alcohol as cleaner ,before you use other cleaning solvent ,please make sure that the cleaner will not make any damage to the LED performance or the appearance .
- Ultrasonic Cleaning is also commonly used for cleaning LED , please verify the Ultrasonic cleaning's Power and time to avoid any damage to the LED.

Storage

- Storage condition before opening the package: 5°C to 30°C, the largest percentage relative humidity is 60% and the storage period is one month. The LEDs beyond the storage period just can be used after dealing as step 4.
- After opening the package, If the LEDs will be Infrared reflow soldering, Oxygen phase reflow soldering or any other welding.
 - a. must be welding within 24 hours.
 - b. the storage humidity must be below 30% .
- If the situation does not satisfy 2a or 2b, the LEDs must be roasted.
- If the LEDs need to be roasted, the roast temperature should be 60°C $\pm$ 3 and the roast timeshould be 48 hours.

Part Number Table

Description	Part Number
SMD LED, Red / Yellow, 120°, 500mcd / 650mcd, 3.5mm x 2.8mm	MP007089

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