

R3528VGC-2B

**3.5x2.8mm, Red & Yellow Green LED
Surface Mount PLCC-4 LED Indicator**



Technical Data Sheet

Features:

- PLCC-4 package.
- White package.
- Colorless clear window.
- Inter reflector.
- Wide viewing angle.
- Suitable for automatic placement equipment.
- Suitable for vapor-phase reflow, Infrared reflow and wave solder processes.
- Available on tape and reel (8mm Tape).
- The product itself will remain within RoHS compliant Version.

Descriptions:

- The R3528 series is available in soft red, orange, yellow, green, blue and white. Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector. This feature makes the SMT 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.

Applications:

- Indicator and backlight in office and family equipment.
- Flat backlight for LCD's, switches and symbols.
- Light pipe application.
- General use.

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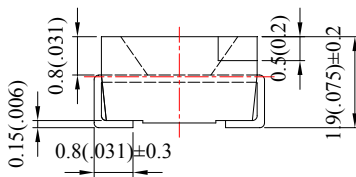
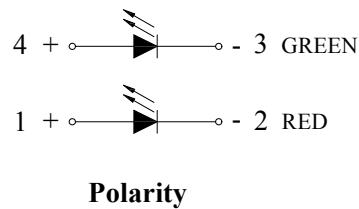
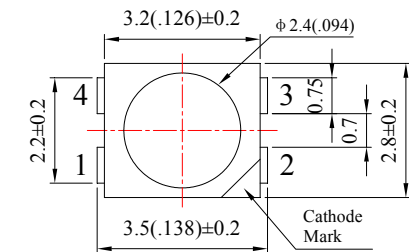
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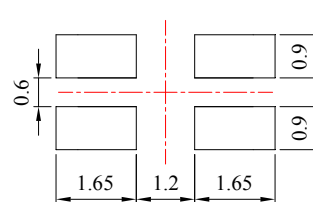
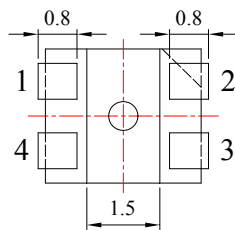
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Part No.	Emitting Color	Lens Color
R3528VGC-2B	V Red	Water Clear
	G Yellow Green	

Package Dimension:



Recommended Soldering Pad Dimensions



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010") unless otherwise noted.

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Absolute Maximum Ratings at Ta=25°C

Parameters	Symbol	Emitting Color	Max.	Unit
Power Dissipation	PD	Red	60	mW
		Yellow Green	60	
Peak Forward Current ^(a)	IFP	Red	100	mA
		Yellow Green	100	
Continuous Forward Current ^(b)	IF	Red	25	mA
		Yellow Green	25	
Reverse Voltage	VR	5		V
Electrostatic Discharge (HBM)	ESD	Red	2000	V
		Yellow Green	2000	V
Operating Temperature Range	Topr		-40°C to +80°C	
Storage Temperature Range	Tstg		-40°C to +85°C	
Soldering Temperature	Tsld		260°C for 5 Seconds	

Notes:

- a. Derate linearly as shown in derating curve.
- b. Duty Factor = 10%, Frequency = 1 kHz

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Electrical Optical Characteristics at Ta=25°C

Parameters	Symbol	Emitting Color	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity ^(a)	IV	Red	100	200	---	mcd	IF=20mA
		Yellow Green	30	70	---		
Viewing Angle ^(b)	2θ1/2	Red	---	120	---	Deg	IF=20mA
		Yellow Green	---	120	---		
Peak Emission Wavelength	λp	Red	---	632	---	nm	IF=20mA
		Yellow Green	---	575	---		
Dominant Wavelength ^(c)	λd	Red	---	624	---	nm	IF=20mA
		Yellow Green	---	573	---		
Spectral Line Half-Width	Δλ	Red	---	20	---	nm	IF=20mA
		Yellow Green	---	20	---		
Forward Voltage	VF	Red	1.60	2.00	2.40	V	IF=20mA
		Yellow Green	1.60	2.00	2.40		
Reverse Current	IR	Red	---	---	10	μA	VR=5V
		Yellow Green	---	---	10		

Notes:

- Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.
- 2θ1/2 is the θ -axis angle where the luminous intensity is 1/2 the peak intensity
- The dominant wavelength (λ_d) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

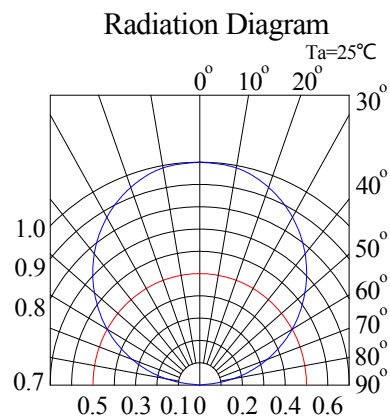
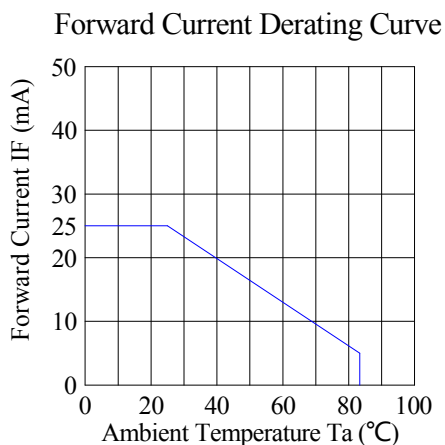
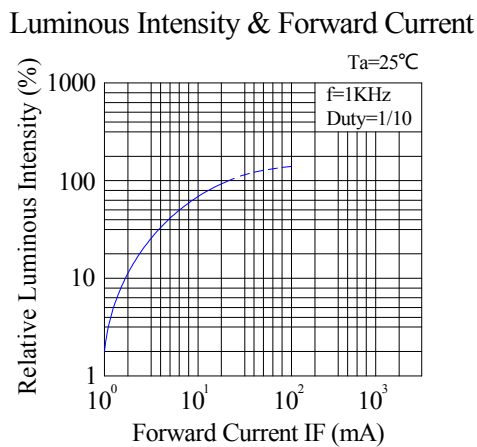
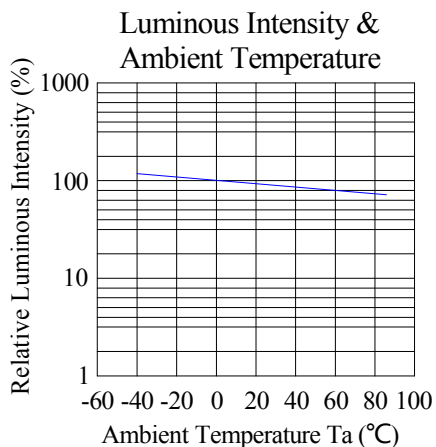
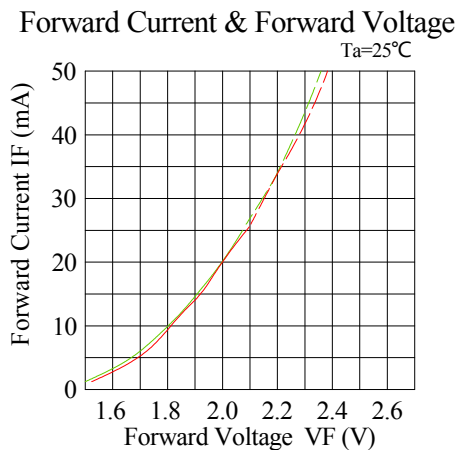
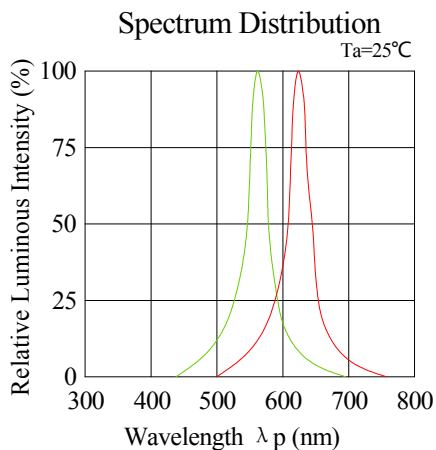
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Typical Electrical / Optical Characteristics Curves (25°C Ambient Temperature Unless Otherwise Noted)



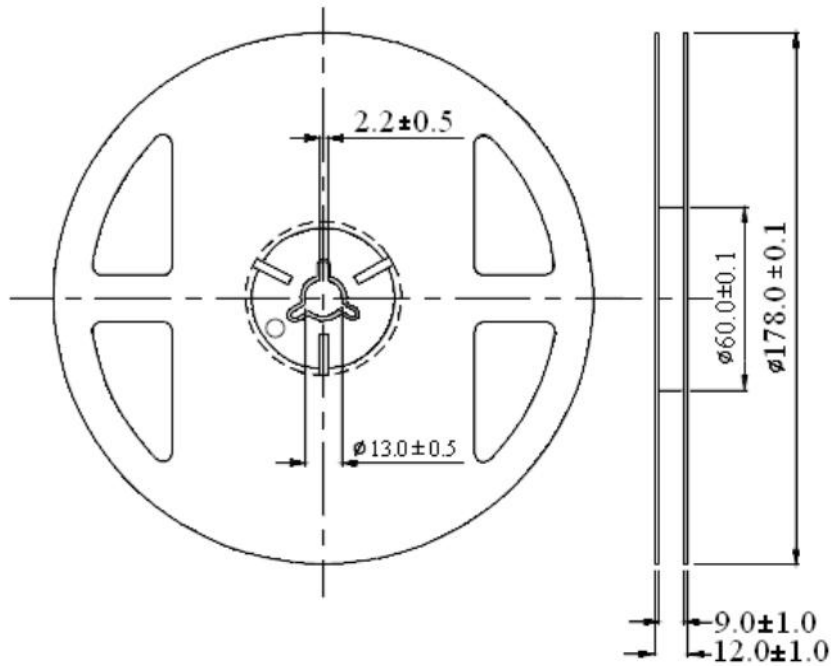
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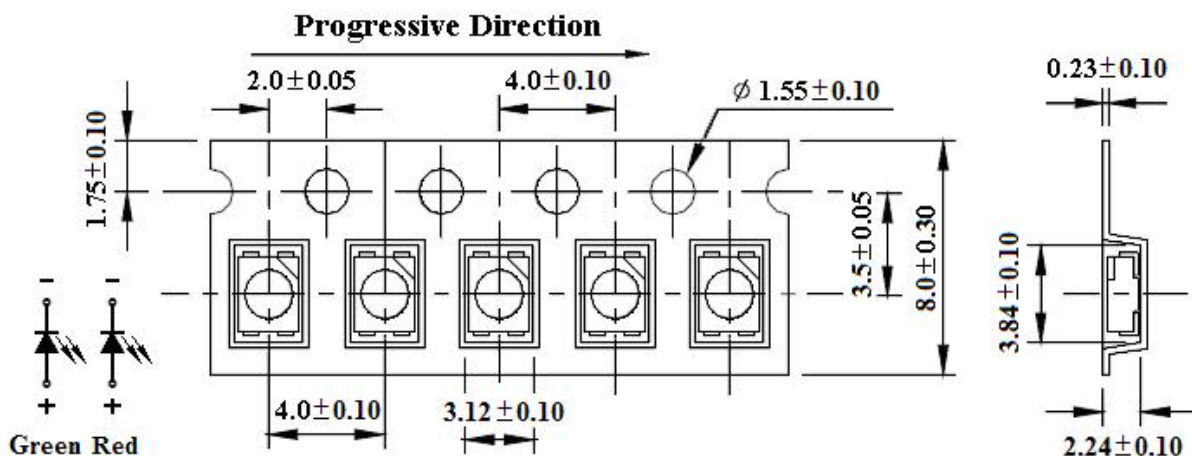
Reel Dimensions:



Unit: mm
Tolerance: ± 0.25 mm

Carrier Tape Dimensions:

Loaded quantity 2000 pcs per reel.



Unit: mm
Tolerance: ± 0.10 mm

Spec No.: R3528

Issue No.: G-Rev-4

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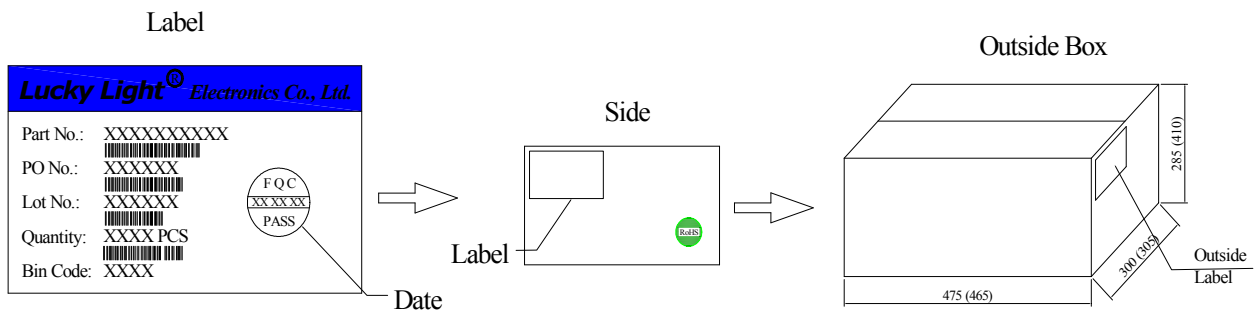
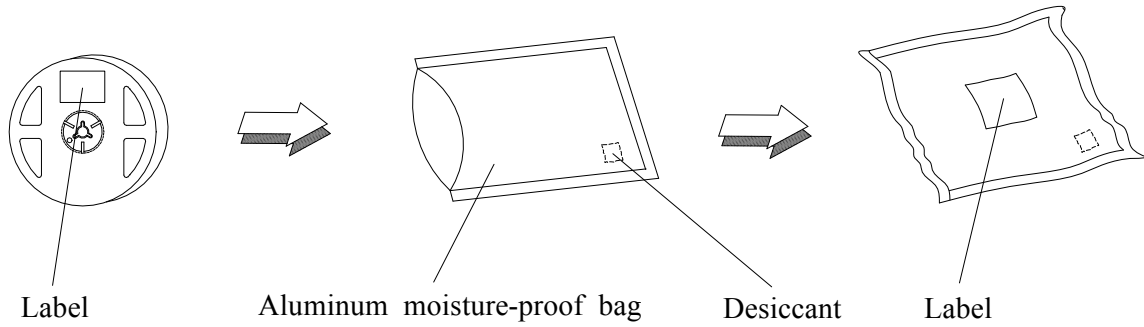
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Packing & Label Specifications:

Moisture Resistant Packaging:



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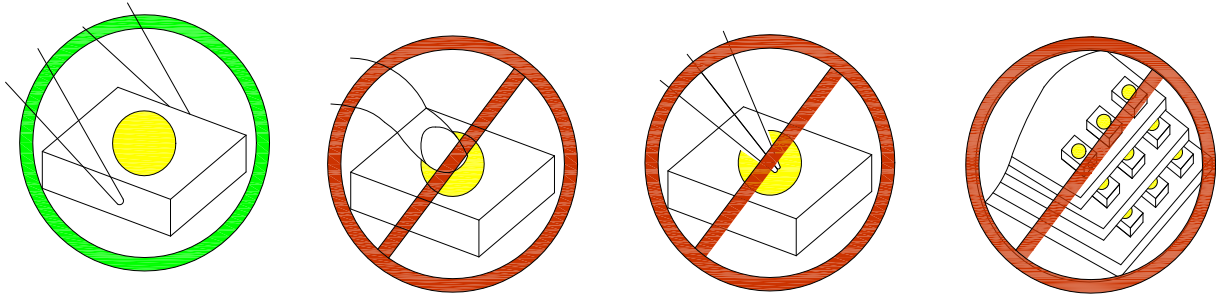
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CAUTIONS

1. Handling Precautions:

- 1.1. Handle the component along the side surfaces by using forceps or appropriate tools.
- 1.2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.
- 1.3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force. As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

2. Storage

- 2.1. Do not open moisture proof bag before the products are ready to use.
- 2.2. Before opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.
- 2.3. The LEDs should be used within a year.
- 2.4. After opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.
- 2.5. The LEDs should be used within 24 hours after opening the package.
- 2.6. If the moisture adsorbent material has fabled away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment: 65±5°C for 24 hours.

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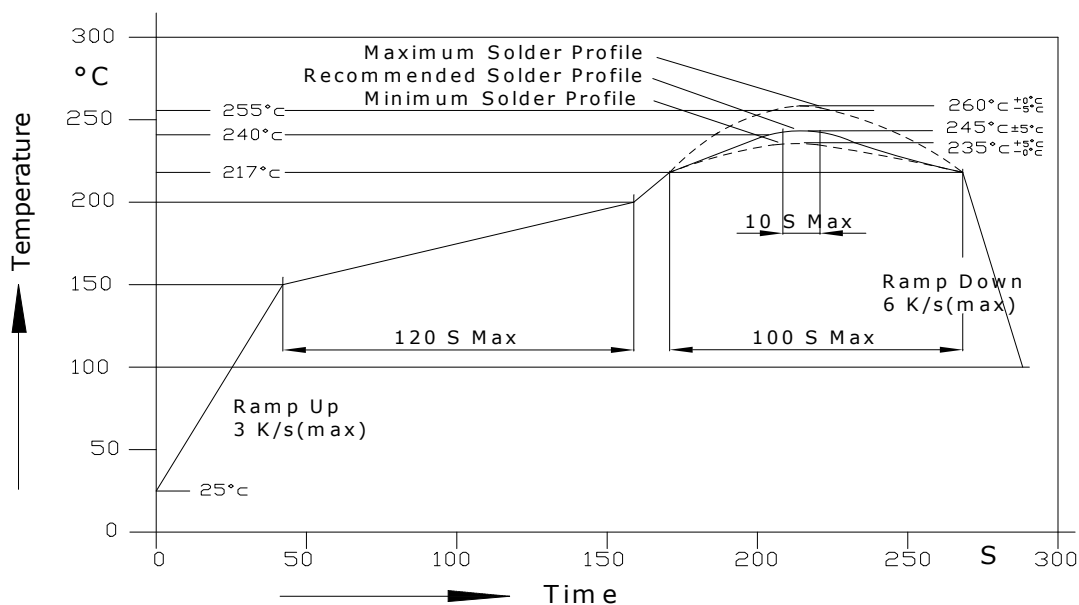
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3. Soldering Condition

3.1. Pb-free solder temperature profile



3.2. Reflow soldering should not be done more than two times.

3.3. When soldering, do not put stress on the LEDs during heating.

3.4. After soldering, do not warp the circuit board.

3.5. Recommended soldering conditions:

Reflow soldering		Soldering iron	
Pre-heat	150~200°C	Temperature	300°C Max.
Pre-heat time	120 sec. Max.	Soldering time	3 sec. Max.
Peak temperature	260°C Max.		(one time only)
Soldering time	10 sec. Max.(Max. two times)		

3.6. Because different board designs use different number and types of devices, solder pastes, reflow ovens, and circuit boards, no single temperature profile works for all possible combinations.

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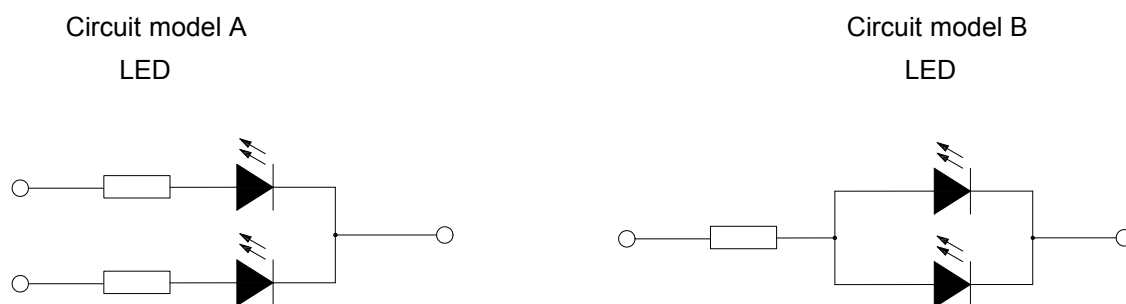


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However, you can successfully mount your packages to the PCB by following the proper guidelines and PCB-specific characterization.

4. Drive Method

4.1. An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.



- Recommended circuit.
- The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

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