R5050RGBWC-001

5.0x5.0mm, Multi-color LED

Surface Mount PLCC-8 LED Indicator

Technical Data Sheet

Features:

- PLCC-8 package.
- Super luminosity LED.
- Several colors available.
- Built in 4 LED chips.
- Wide viewing angle.
- High performance.
- Industry standard footprint.
- Computable with automatic placement equipment.
- Soldering methods: Reflow Soldering.
- The product itself will remain within RoHS compliant Version.

Descriptions:

- The R5050 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:

- Reading lights (car, bus, aircraft).
- Portable (flashlight, bicycle).
- Mini-accent / Up lighters / Down lighters / Orientation.
- Bollards / Security / Garden.
- Cove / Under shelf / Task.
- Automotive rear combination lamps.
- Traffic signaling / Beacons / Rail crossing and Wayside.
- Indoor / Outdoor Commercial and Residential Architectural.
- Edge-lit signs (Exit, point of sale).

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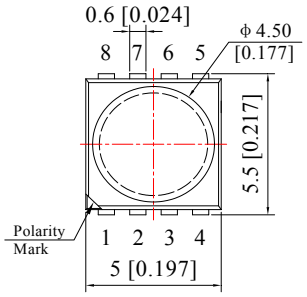
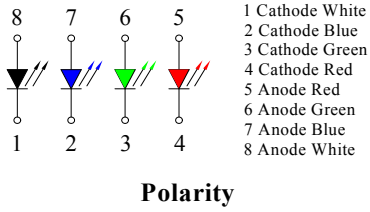
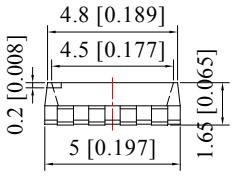
Part No.	Emitting Color		Lens Color
R5050RGBWC-001	R	Red	Water Clear
	G	Pure Green	
	B	Blue	
	W	Cool white	Yellow Diffused

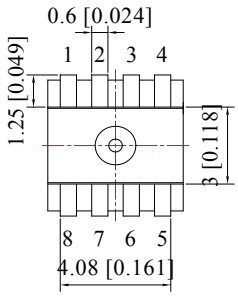
Package Dimension:



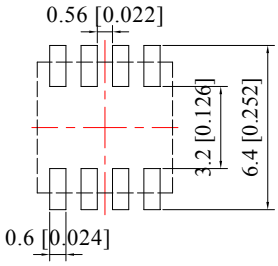


Polarity





Recommended Soldering Pad dimensions



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010″) unless otherwise noted.
3. Protruded resin under flange is 1.00mm (.039″) max.

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Absolute Maximum Ratings at Ta=25℃

Parameters	Symbol		Max.	Unit
Power Dissipation	PD	R	52	MW
		G	72	
		B	72	
		W	108	
Peak Pulsed Forward Current (mA)	IFP		100	mA
DC Forward Current (mA)	IF		30	mA
Operating Temperature Range	Topr		-40℃ to +85℃	
Storage Temperature Range	Tstg		-40℃ to +80℃	
Soldering Temperature	Tsld		260℃ 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℃

Parameters	Symbol	Emitting Color	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity (Note 1)	IV	Hyper Red	300	500	---	mcd	IF=20mA
		Pure Green	1500	2200	---	mcd	IF=20mA
		Blue	250	450	---	mcd	IF=20mA
Luminous Flux *	Φv	White	9	10	---	lm	IF=30mA
Viewing Angle	$2\theta_{1/2}$	---	---	120	---	Deg	IF=20mA
Dominant Wavelength	λd	Hyper Red	---	624	---	nm	IF=20mA
		Pure Green	---	525	---		IF=20mA
		Blue	---	470	---		IF=20mA
Spectral Line Half-Width	△λ	Hyper Red	---	20	---	nm	IF=20mA
		Pure Green	---	35	---		IF=20mA
		Blue	---	25	---		IF=20mA
Color Temperature	CCT	White	---	6500	---	K	IF=30mA
Forward Voltage	VF	Hyper Red	1.80	2.00	2.60	V	IF=20mA
		Pure Green	2.80	3.20	3.60		IF=20mA
		Blue	2.80	3.20	3.60		IF=20mA
		White	2.80	3.20	3.60		IF=30mA
Reverse Current	IR	Hyper Red	---	---	10	μA	V_R=5V
		Pure Green			50		
		Blue			50		
		White	---	---	50		

Notes:

a. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.

b. $2\theta_{1/2}$ is the o-axis angle where the luminous intensity is 1⁄2 the peak intensity.

c. The dominant wavelength (λd) is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

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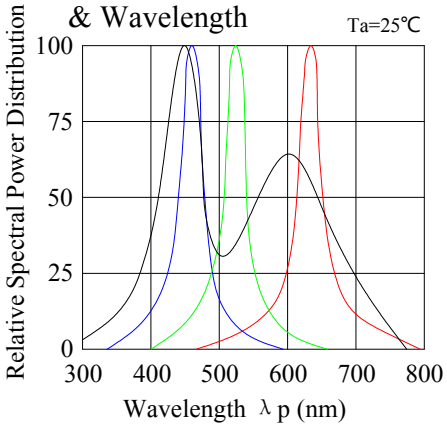
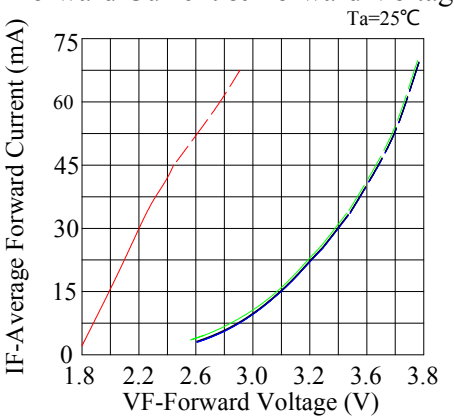
Typical Electrical / Optical Characteristics Curves (25℃ Ambient Temperature Unless Otherwise Noted)

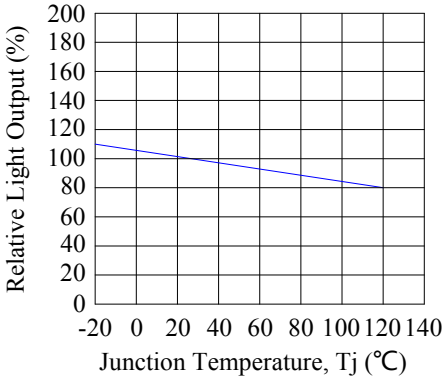
Relative Luminous Intensity & Wavelength



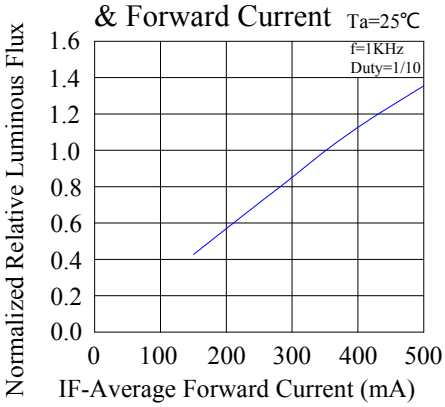
Forward Current & Forward Voltage



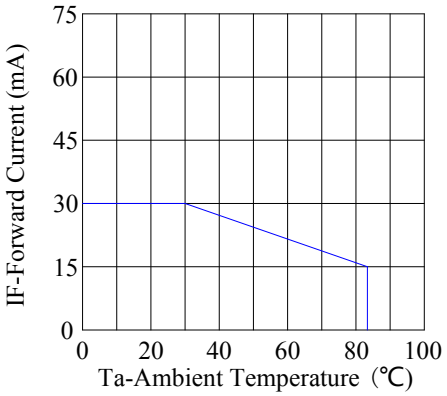
Light Output Characteristics



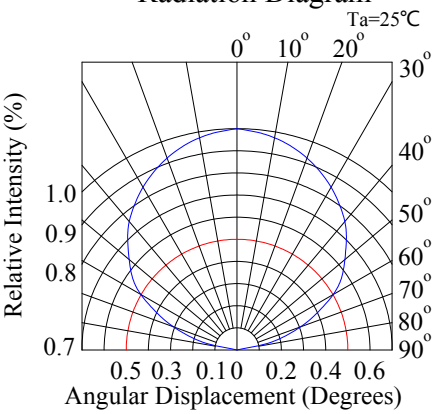
Relative Luminous Flux & Forward Current



Current Derating Curves



Radiation Diagram



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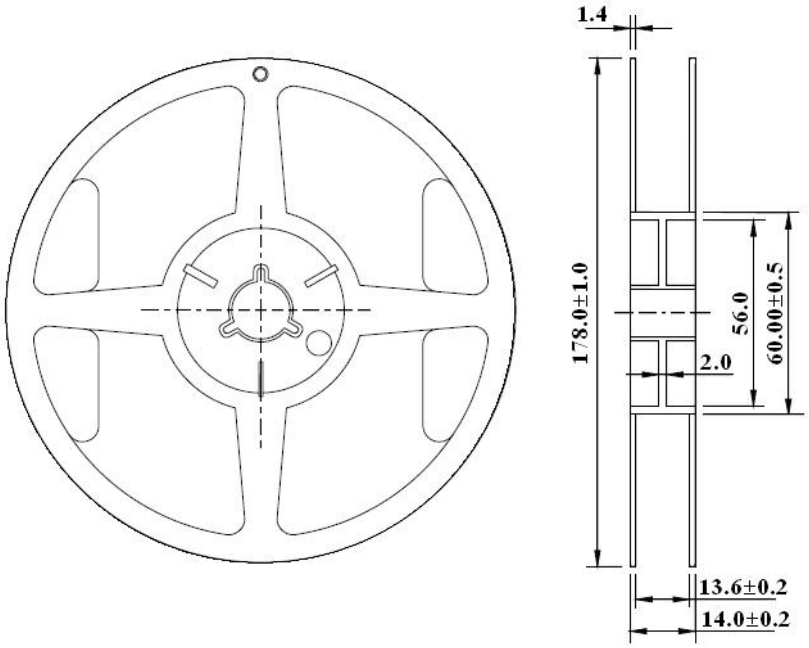
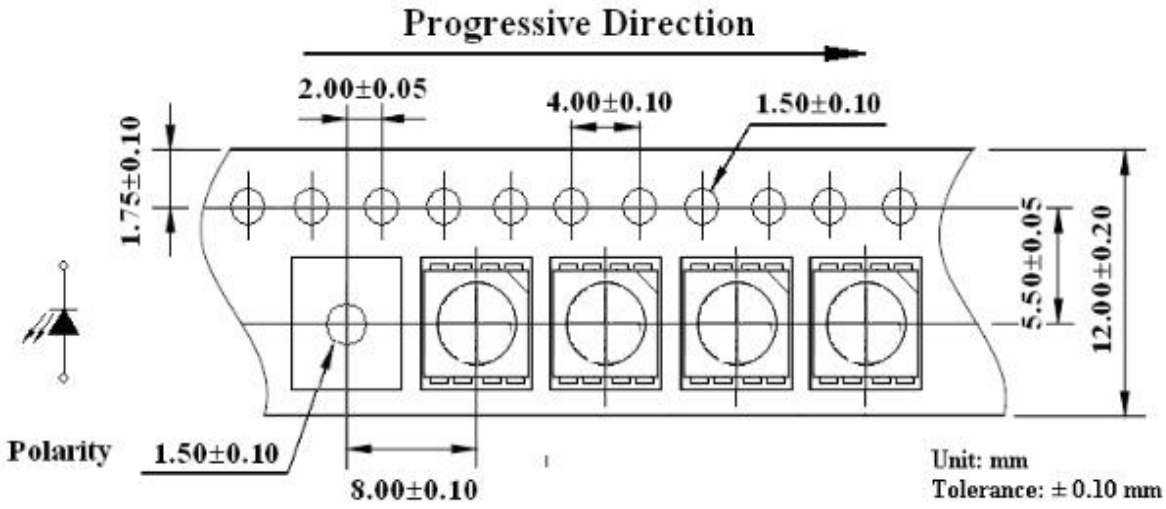
Reel Dimensions:



Carrier Tape Dimensions:

Loaded quantity 1000 pcs per reel.



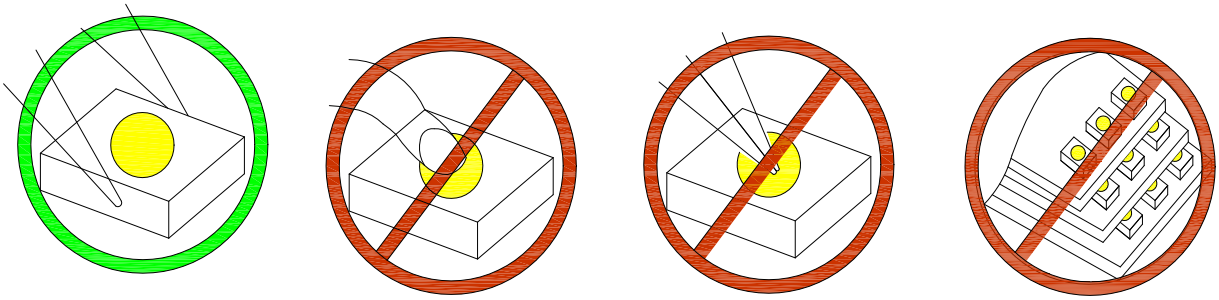
CAUTIONS

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.

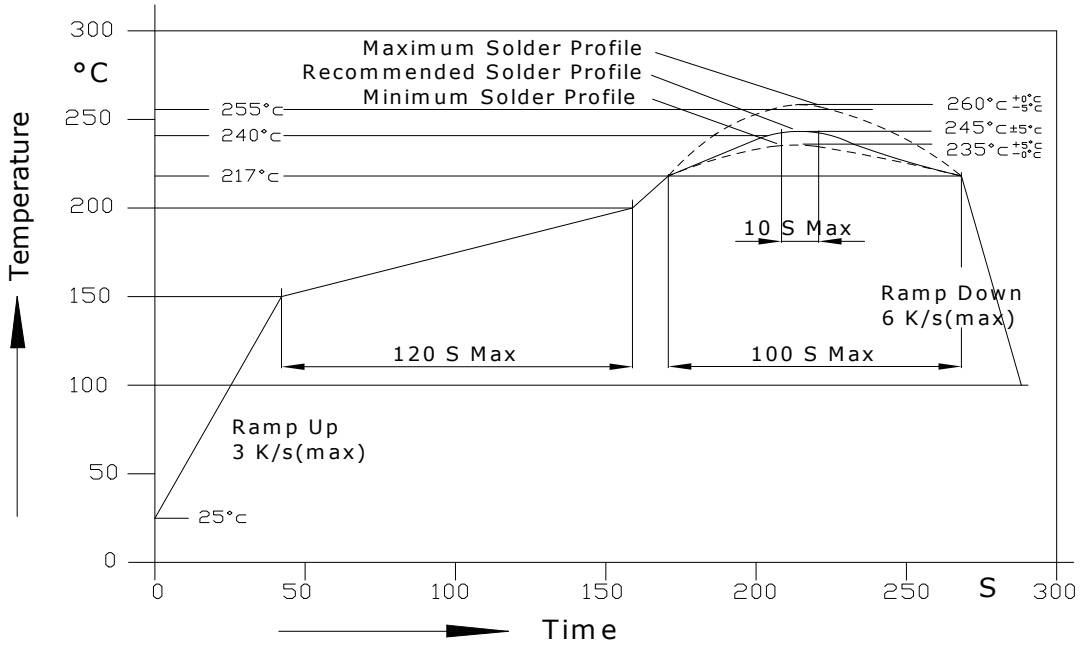
2.4. After opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.

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.

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	250°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.

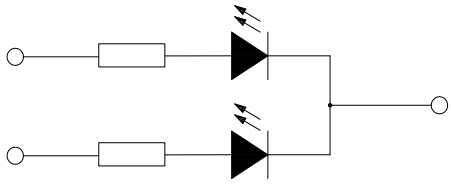
However, you can successfully mount your packages to the PCB by following the proper guidelines and PCB-specific characterization.

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.

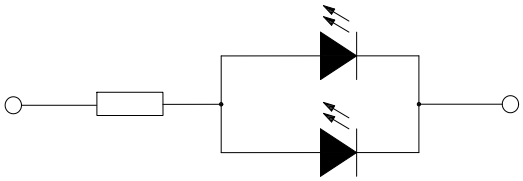
Circuit model A

LED



Circuit model B

LED



a. Recommended circuit.

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

5. ESD (Electrostatic Discharge):

Static Electricity or power surge will damage the LED. Suggestions to prevent ESD damage:

- Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.
- All devices, equipment, and machinery must be properly grounded.
- Work tables, storage racks, etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or "no lightup" at low currents. To verify for ESD damage, check for "lightup" and Vf of the suspect LEDs at low currents. The Vf of "good" LEDs should be >2.0V@0.1mA for InGaN product and >1.4V@0.1mA for AlInGaP product.

Technical Data Sheet

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