RGBYW 5-in-1 Multi-Color Surface Mount LEDs

PLCC-10 Multi-Color 5-in-1 Surface Mount LEDs

Technical Data Sheet

Features:

- Top view multi-color LEDs
- Wide viewing angle
- Lead frame package with individual 10 pins
- High reliability package with enhanced silicone resin encapsulation
- Compatible with reflow soldering process.
- Compliance with RoHS and REACH

Descriptions:

The R5050RGBYW-AK is an RGBYW 5-in-1, 5-color surface mount LED. It internally encapsulates 5 LED chips and employs a design with 10 separate pins, providing customers with greater flexibility in circuit design. Depending on the application's requirements, customers can individually control this LED in five colors: red, green, blue, yellow, and white, or achieve color mixing control with the RGB tricolor. This LED offers high reliability, high-intensity light output, and a wide viewing angle. This 5-in-1 multi-color surface mount LED is compatible with reflow soldering processes.

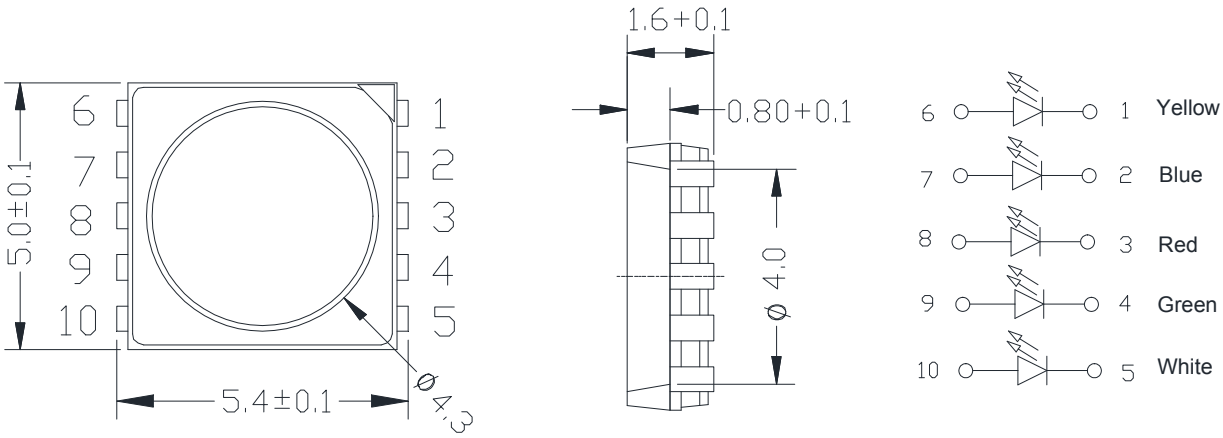
Applications:

- Instrument panel backlighting
- Central console backlighting
- Switch push button backlighting
- Electronic signs and signals
- Decoration lighting
- Office automation, home appliances, industrial equipment.

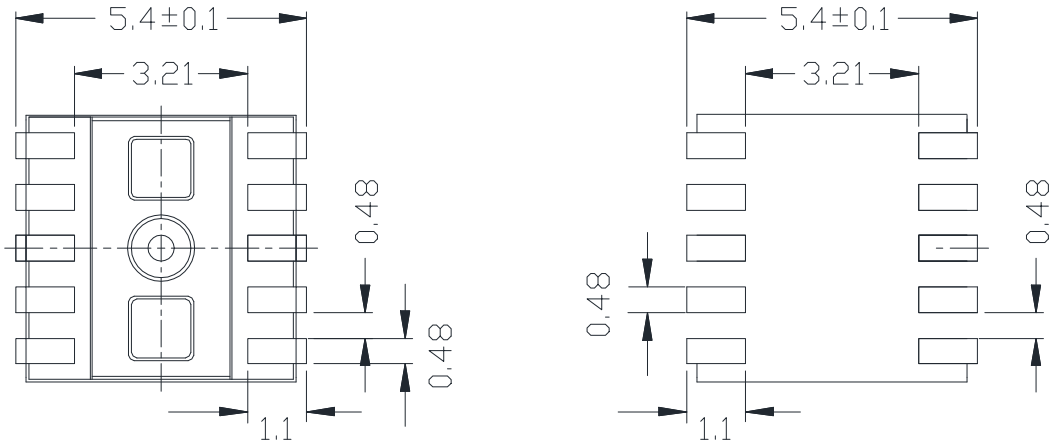
Part No.	Emitting Color	Lens Color
R5050RGBYW-AK	Red	Water Clear
	Green	
	Blue	
	Yellow	
	White	

Technical Data Sheet

Package Dimension:



Recommended Soldering Pad Dimensions



Notes:

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

Absolute Maximum Ratings at Ta=25 ℃

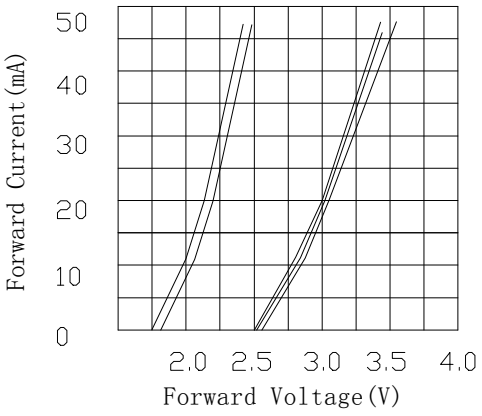
Parameters	Symbol	Red	Green	Blue	Yellow	White	Unit
Power Dissipation	Pd	65	85	85	65	85	mW
Peak Forward Current	IFP	60	60	60	60	60	mA
DC Forward Current	IF	20	20	20	20	20	mA
Reverse Voltage	VR	5	5	5	5	5	V
Operating Temperature Range	Topr	-40℃ to +85℃					
Storage Temperature Range	Tstg	-40℃ to +85℃					

Electrical Optical Characteristics at Ta=25℃

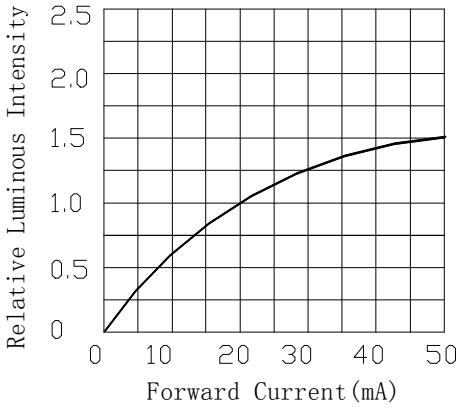
Parameters	Symbol	Color	Min	Typ.	Max.	Unit	Test Comdition
Color Temperature	CCT	W	6000	6500	7500		IF=20mA
Luminous Intensity(a)	IV	R	600	-	900	mcd	
		G	1500	-	2100		
		B	400	-	700		
		Y	600	-	900		
		W	2400	-	3100		
Dominant Wavelength	λd	R	620	-	630	nm	IF=20mA
		G	520	-	525		
		B	465	-	470		
		Y	588	-	594		
Forward Voltage	VF	W	2.8	-	3.4	V	IF=20mA
		R	1.8	-	2.4		
		G	2.8	-	3.4		
		B	2.8	-	3.4		
		Y	1.8	-	2.4		
Viewing Angle(b)	2θ½	W	-	120	-	Deg	IF=20mA
		R					
		G					
		B					
		Y					
Reverse current	IR	W	-	5	-	μA	VR=5V
		R		5			
		G		5			
		B		5			
		Y		5			

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

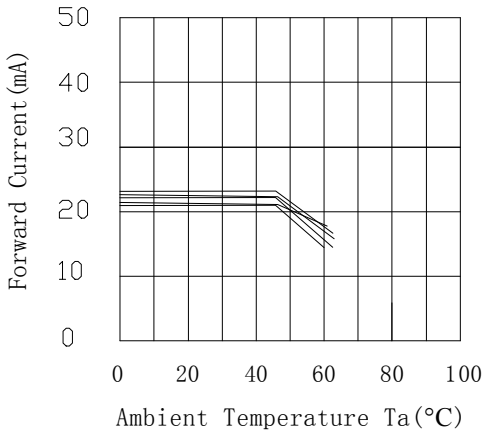
Forward Current VS. Forward Voltage



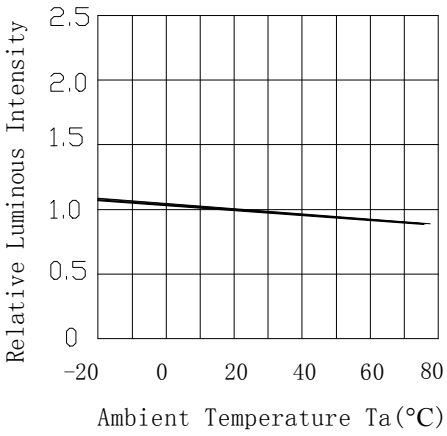
Forward Current VS. Relative Intensity

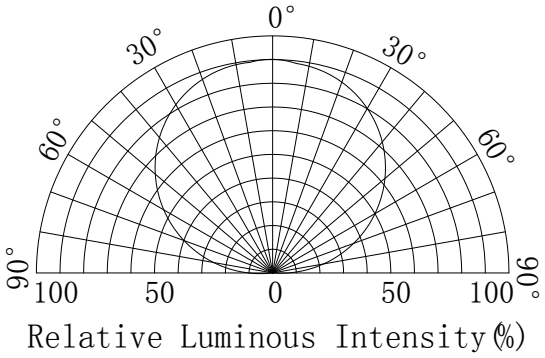


Ambient Temperature VS. Forward Current

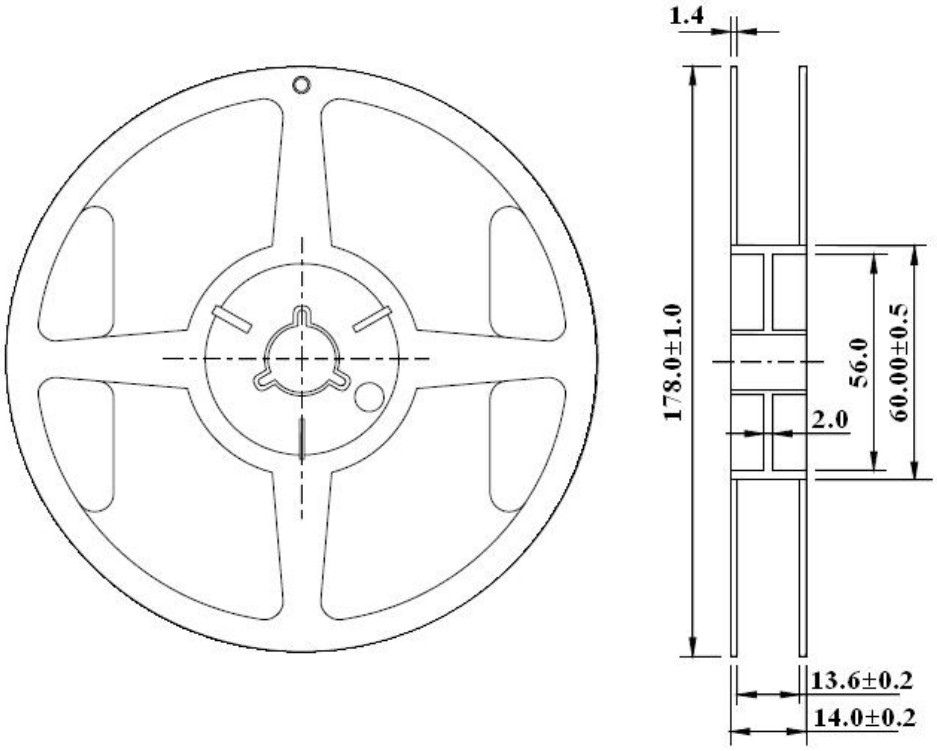


Ambient Temperature VS. Relative Intensity



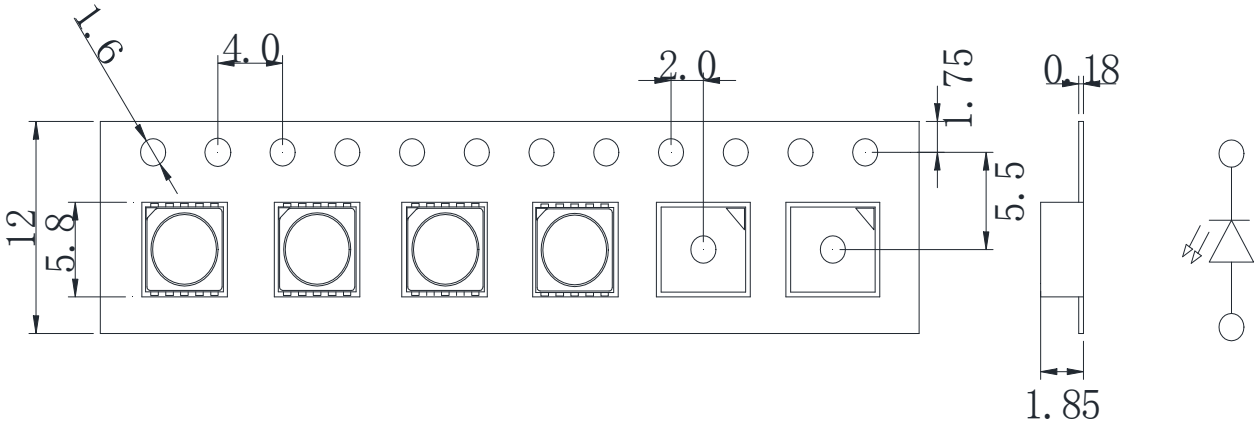


Reel Dimensions:



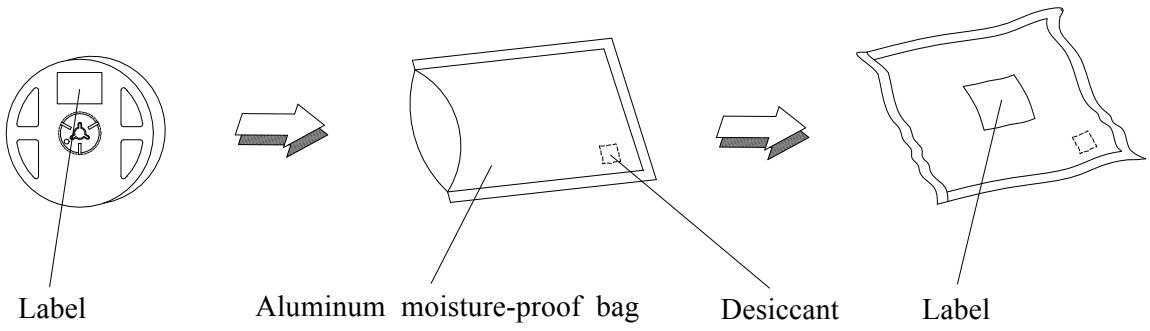
Carrier Tape Dimensions:

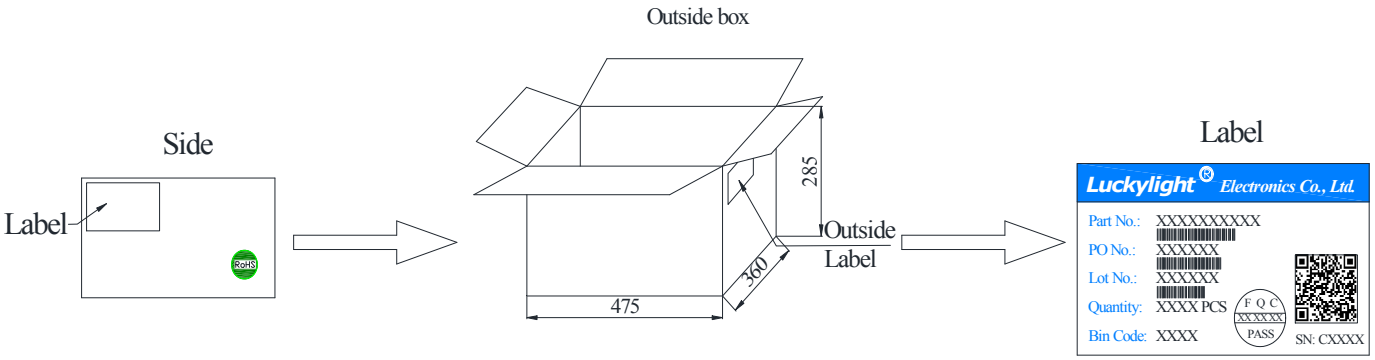
Loaded quantity 1000 pcs per reel.



Packing & Label Specifications:

Moisture Resistant Packaging:





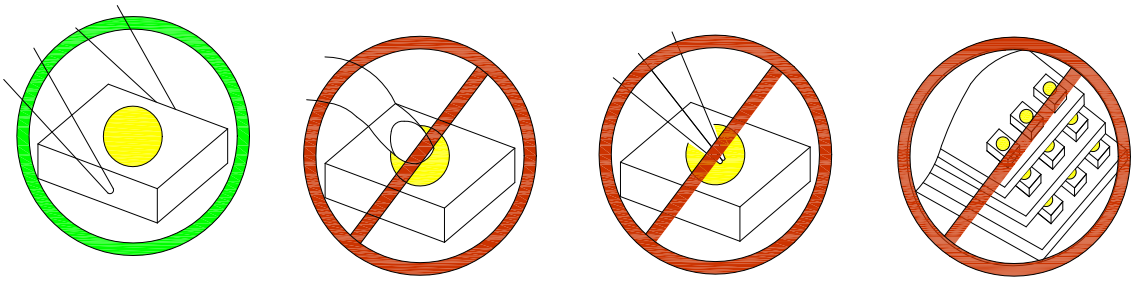
CAUTIONS

1. Handling Precautions:

1.1. Handle the component along the side surfaces by using forceps or appropriate tools.

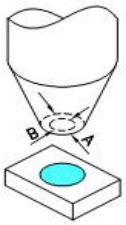
1.2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.

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.

1.4. The outer diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks. The inner diameter of the nozzle should be as large as possible. pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup.



1.5. The encapsulated material of the LEDs is silicone. Therefore, the LEDs have a soft surface on the top of package. The pressure to the top surface will be influence to the reliability of the LEDs. Precautions should be taken to avoid the strong pressure on the encapsulated part. So, when use the picking up nozzle, the pressure on the silicone resin should be proper.

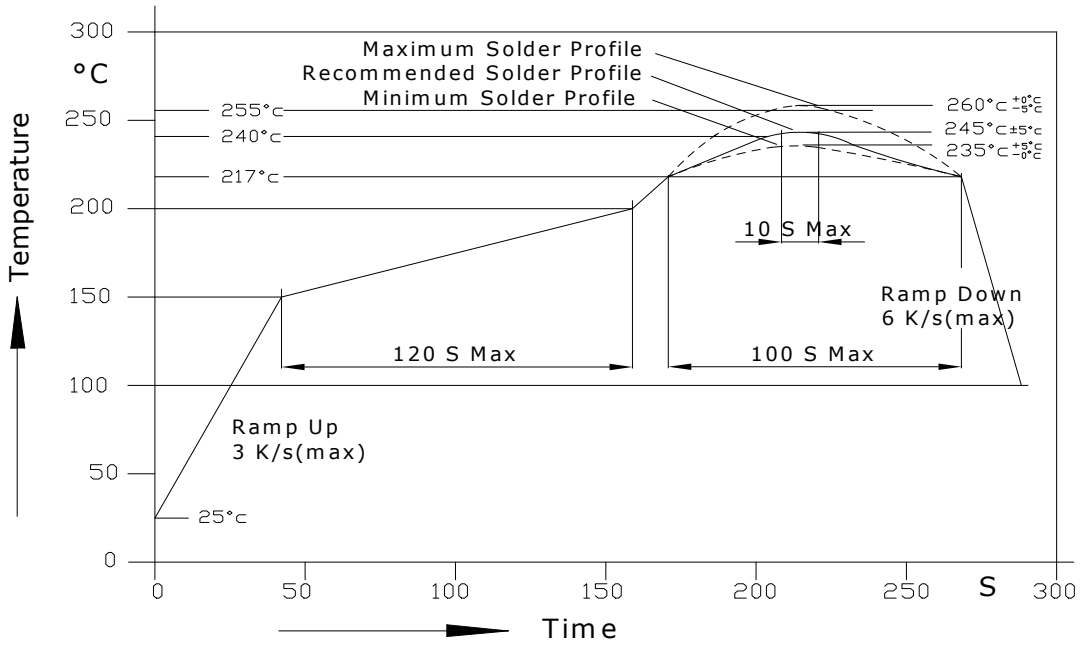
2. Storage

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	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.

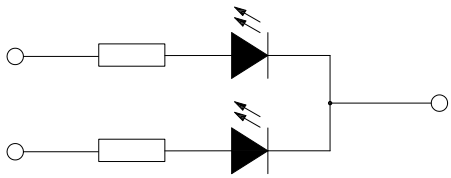
However, you can successfully mount your packages to the PCB by following the proper guidelines and PCB-specific characterization.

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.

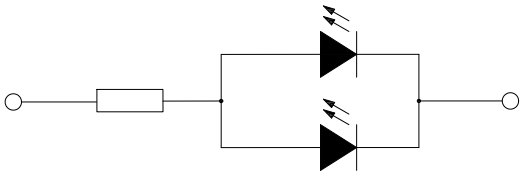
Circuit model A

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.

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