5.5x5.0mm,Multi-color LED Surface Mount PLCC-6 LED IndicatorTechnical Data Sheet

Part No.: YBH-R5050URPGUBC

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Features:

- ◇ PLCC-6 package.
- ◇ White package.
- ◇ Optical indicator.
- ◇ Colorless clear window.
- ◇ Ideal for backlight and light pipe application.
- ◇ Wide viewing angle.
- ◇ Suitable for automatic placement equipment.
- ◇ Available on tape and reel (8mm Tape).
- ◇ The product itself will remain within RoHS compliant Version.

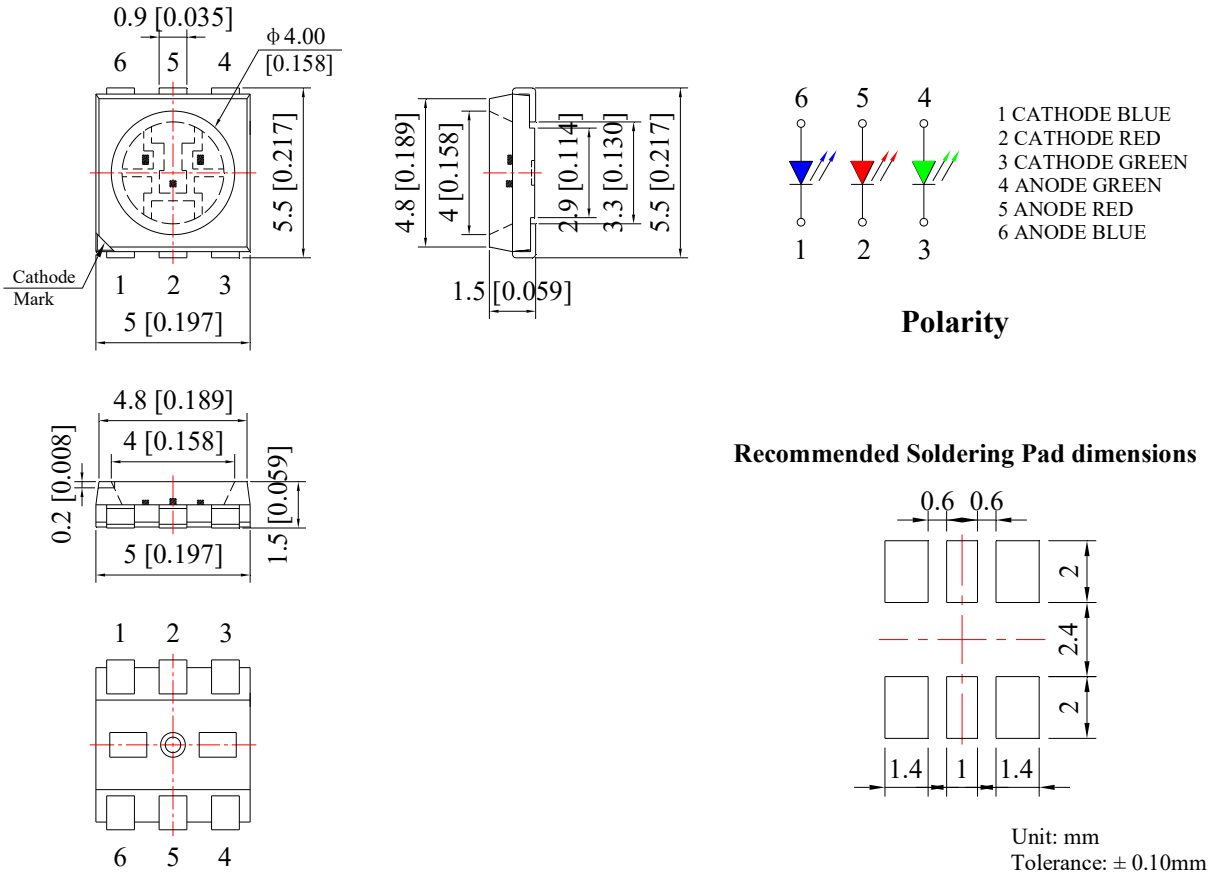
Descriptions:

- ◇ 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:

- ◇ Backlight in dashboards and switches.
- ◇ Telecommunication: Indicator and backlight in telephone and fax.
- ◇ Indicator and backlight for audio and video equipment.
- ◇ Indicator and backlight in office and family equipment.
- ◇ Flat backlight for LCD’ s, switches and symbols.
- ◇ Light pipe application.
- ◇ General use.

Package Dimension:



Part No.	Chip Material		Lens Color	Source Color
YBH-R5050URPGUBC	UR	AlGaInP	Water Clear	Hyper Red
	PG	InGaN		Pure Green
	UB	InGaN		Blue

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	Hyper Red	60	mW
		Pure Green	90	
		Blue	90	
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	IFP	Hyper Red	100	mA
		Pure Green	100	
		Blue	100	
Continuous Forward Current	IF	Hyper Red	25	mA
		Pure Green	25	
		Blue	25	
Reverse Voltage	VR		5	V
Electrostatic Discharge (HBM)	ESD	Hyper Red	2000	V
		Pure Green	1000	
		Blue	1000	
Operating Temperature Range	Topr		-40℃ to +85℃	
Storage Temperature Range	Tstg		-40℃ to +100℃	
Lead Soldering Temperature [4mm (.157〃) From Body]	Tsld		250℃ for 5 Seconds	

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Electrical Optical Characteristics at Ta=25℃

Parameters	Symbol	Emitting Color	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	IV	Hyper Red	600	800	---	mcd	IF=20mA (Note 1)
		Pure Green	1800	2800	---		
		Blue	400	600	---		
Viewing Angle	$2\theta_{1/2}$	Hyper Red	---	120	---	Deg	IF=20mA (Note 2)
		Pure Green	---	120	---		
		Blue	---	120	---		
Peak Emission Wavelength	λp	Hyper Red	---	630	---	nm	IF=20mA (Measurement @Peak)
		Pure Green	---	520	---		
		Blue	---	460	---		
Dominant Wavelength	λd	Hyper Red	---	620	---	nm	IF=20mA (Note 3)
		pure Green	---	525	---		
		Blue	---	470	---		
Spectral Line Half-Width	△λ	Hyper Red	---	20	---	nm	IF=20mA
		Pure Green	---	35	---		
		Blue	---	25	---		
Forward Voltage	VF	Hyper Red	1.60	2.00	2.40	V	IF=20mA
		Pure Green	2.70	3.00	3.40		
		Blue	2.70	3.00	3.40		
Reverse Current	IR	Hyper Red	---	---	10	μA	V_R=5V
		Pure Green			10		
		Blue			10		

Notes:

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

2. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

3. 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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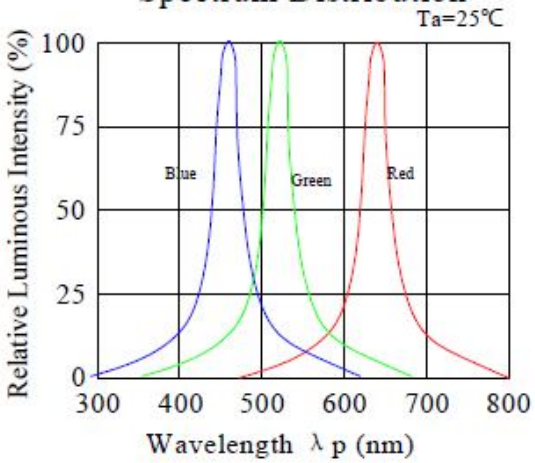
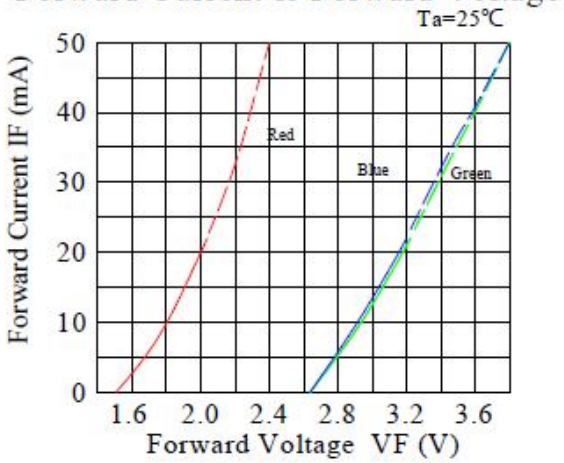
Typical Electrical / Optical Characteristics Curves
(25℃ Ambient Temperature Unless Otherwise Noted)

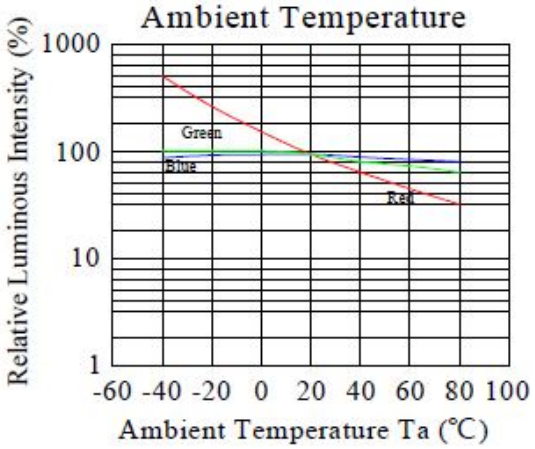
Spectrum Distribution



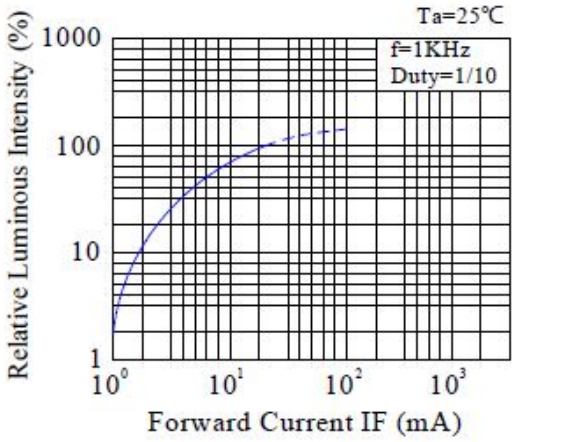
Forward Current & Forward Voltage



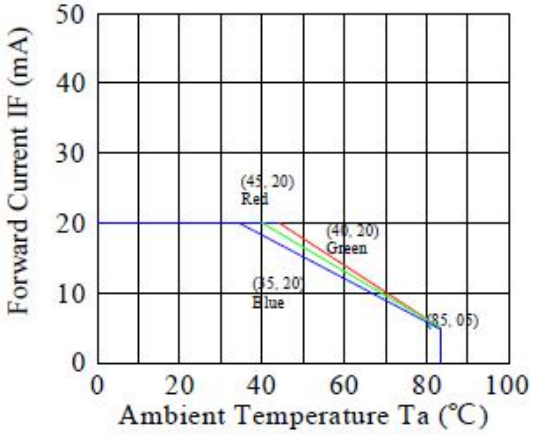
Luminous Intensity & Ambient Temperature



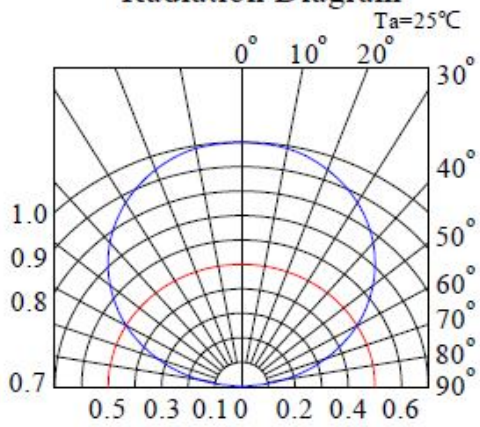
Luminous Intensity & Forward Current



Forward Current Derating Curve



Radiation Diagram



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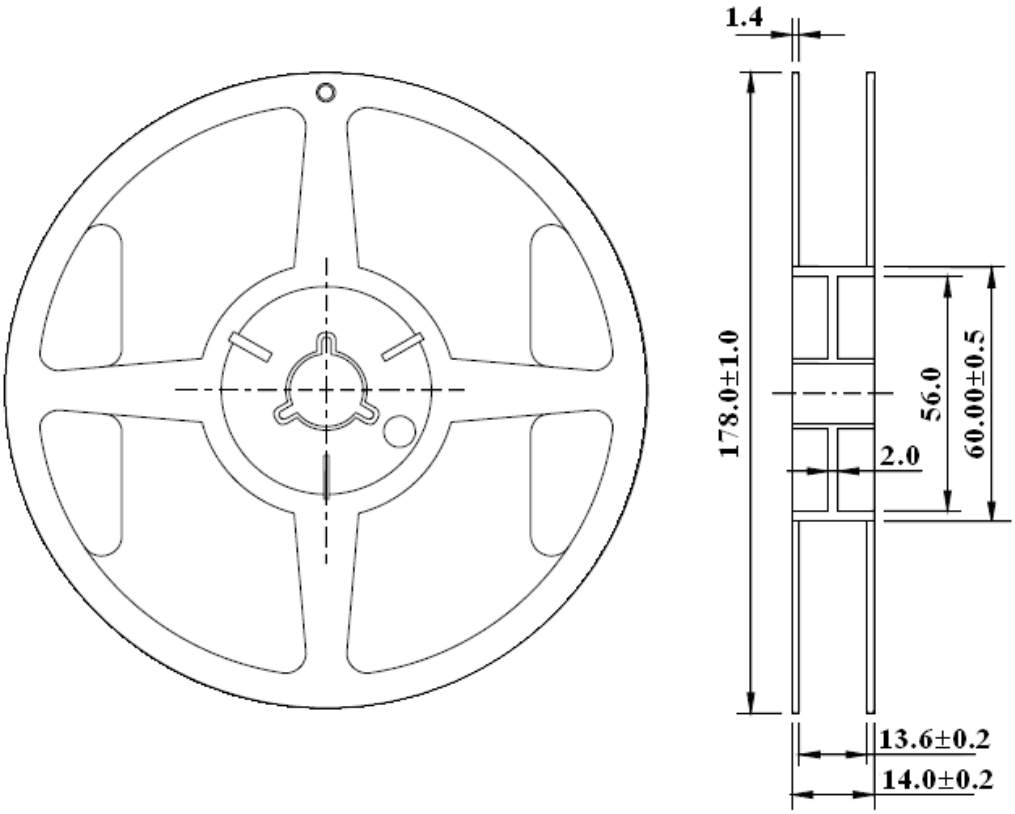
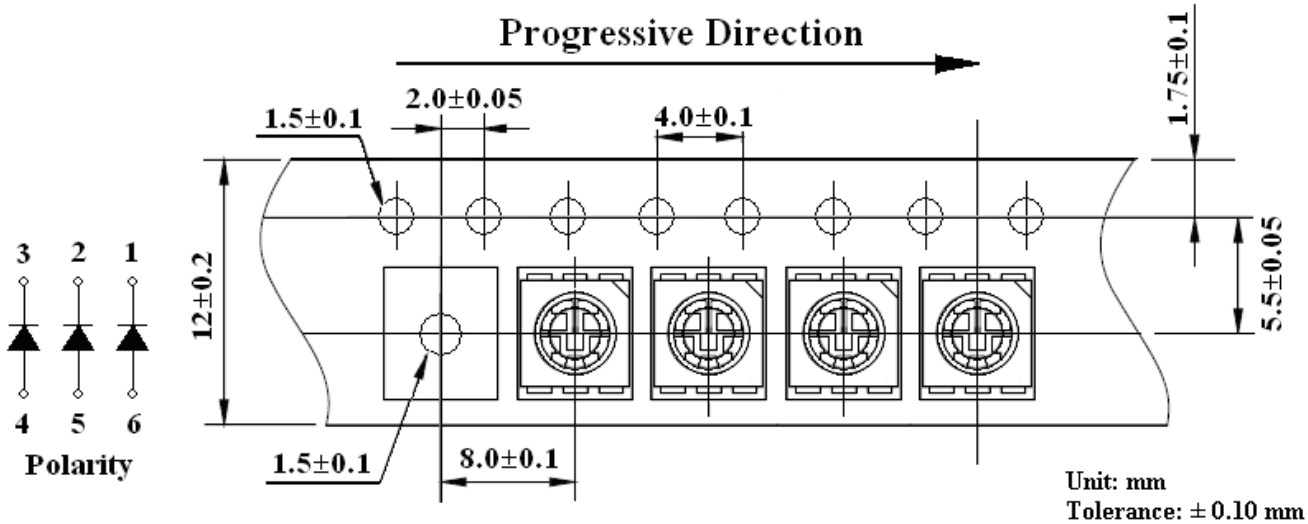
Reel Dimensions:



Carrier Tape Dimensions:

Loaded quantity 1000PCS per reel.



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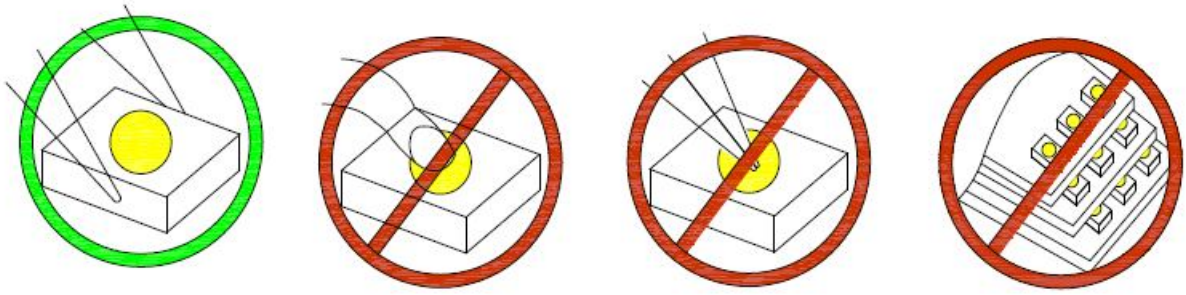
CAUTIONS

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.

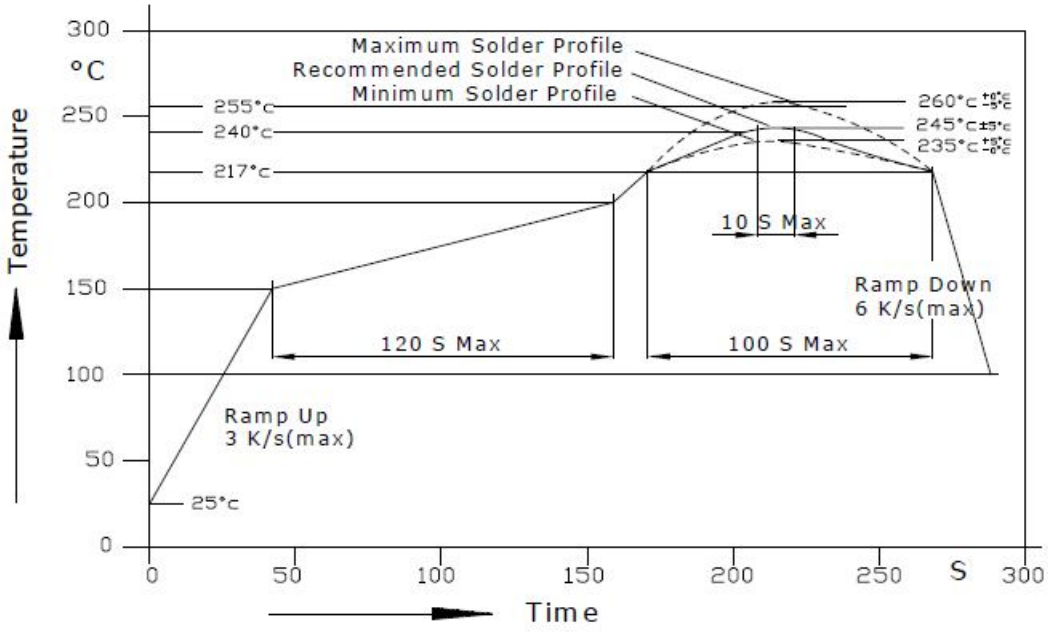
2.4. After opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.

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.

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.

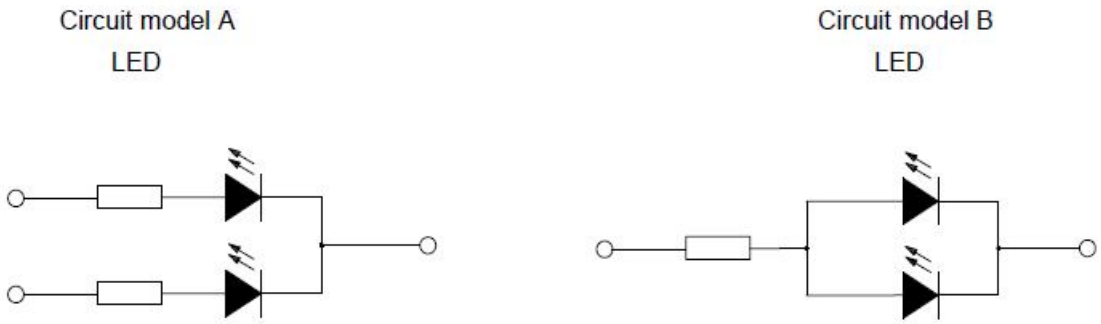
3.5. Recommended soldering conditions:

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.



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:

1.Use of a conductive wrist band or anti-electrostatic glove when handling these LEDs.

2. All devices, equipment, and machinery must be properly grounded.

3. Work tables, storage racks, etc. should be properly grounded.

4. 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.