

# PRODUCT SPECIFICATION

*Part Number*  
**PL84-WCRGB1**

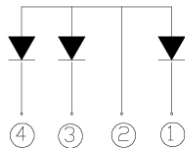
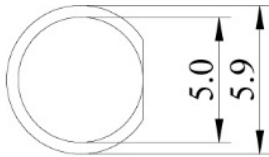
**Details**

- 5mm Round Full Color LED
- Four Leads
- Emitting Color: Red, Green, Blue
- AlInGaP and InGaN dice used

**Features**

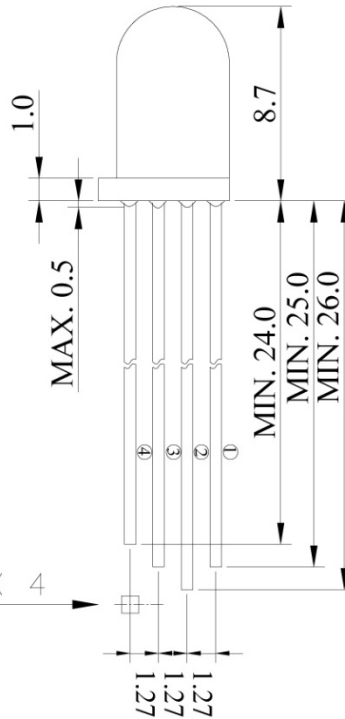
- RoHS Compliant
- Low Power Consumption
- Rugged and Durable

**Mechanical Dimensions**



- ① Hyper Red Cathode
- ② Common Anode
- ③ Blue Cathode
- ④ True green Cathode

0.5 SQUARE X 4



**Notes:**

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



**Device Selection Guide**

Part Number	Chip	
	Material	Emitting Color
PL84-WCRGB1	AllInGaP	Hyper Red
	InGaN	True Green
	InGaN	Blue

**Absolute Maximum Ratings at Ta=25 °C**

Hyper Red			
Parameter	Symbol	Rating	Unit
Power Dissipation	P <sub>D</sub>	75	mW
Reverse Voltage	VR	5	V
DC Forward Current	IF	30	mA
Peak Current (duty cycle 1/10, 1KHz)	IPF	100	mA
Operating Temperature	Topr	-40~+105	°C
Storage Temperature	Tstg	-40~+105	°C
Soldering Temperature (1.6mm from body)	Tsol.	Dip Soldering : 260°C for 5 sec. Hand Soldering : 350°C for 3 sec.	

True Green			
Parameter	Symbol	Rating	Unit
Power Dissipation	P <sub>D</sub>	120	mW
Reverse Voltage	VR	5	V
DC Forward Current	IF	30	mA
Reverse (Leakage) Current	I <sub>r</sub>	100	μA
Peak Current (duty cycle 1/10, 1KHz)	IPF	100	mA
Operating Temperature	Topr	-25~+85	°C
Storage Temperature	Tstg	-40~+100	°C
Soldering Temperature (1.6mm from body)	Tsol.	Dip Soldering : 260°C for 5 sec. Hand Soldering : 350°C for 3 sec.	
Electrostatic discharge	ESD	300	V

Blue			
Parameter	Symbol	Rating	Unit
Power Dissipation	P <sub>D</sub>	120	mW
Reverse Voltage	VR	5	V
DC Forward Current	IF	30	mA
Reverse (Leakage) Current	I <sub>r</sub>	50	μA
Peak Current (duty cycle 1/10, 1KHz)	IPF	100	mA
Operating Temperature	Topr	-25~+85	°C
Storage Temperature	Tstg	-40~+100	°C
Soldering Temperature (1.6mm from body)	Tsol.	Dip Soldering : 260°C for 5 sec. Hand Soldering : 350°C for 3 sec.	
Electrostatic discharge	ESD	300	V

**Electrical and Optical Characteristics at Ta=25 °C**

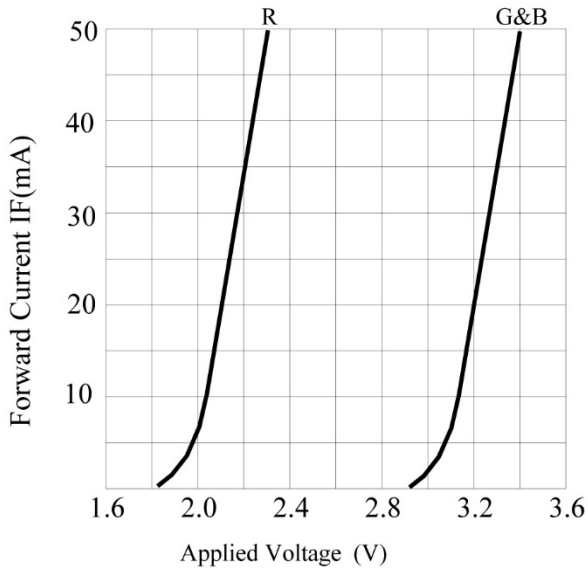
<b>Hyper Red</b>						
<b>Parameter</b>	<b>Symbol</b>	<b>Min.</b>	<b>Typ.</b>	<b>Max.</b>	<b>Unit</b>	<b>Condition</b>
Forward Voltage Per Segment	<b>VF</b>	--	2.1	2.5	V	IF=20mA
Luminous Intensity	<b>Iv</b>	2000	4000	--	mcd	IF=20mA
Peak Wavelength	$\lambda P$	--	632	--	nm	IF=20mA
Dominant Wavelength	$\lambda d$	--	625	--	nm	IF=20mA
Reverse (Leakage) Current	<b>Ir</b>	--	--	100	nm	Vr=5V
Viewing Angle	2 $\theta$ 1/2	--	40	--	--	deg
Spectrum Line Halfwidth	$\Delta\lambda$	--	20	--	--	IF=20mA

<b>True Green</b>						
<b>Parameter</b>	<b>Symbol</b>	<b>Min.</b>	<b>Typ.</b>	<b>Max.</b>	<b>Unit</b>	<b>Condition</b>
Forward Voltage Per Segment	<b>VF</b>	--	3.2	4.0	V	IF=20mA
Luminous Intensity	<b>Iv</b>	1000	2500	--	mcd	IF=20mA
Dominant Wavelength	$\lambda d$	--	520	--	nm	IF=20mA
Reverse (Leakage) Current	<b>Ir</b>	--	--	50	nm	Vr=5V
Viewing Angle	2 $\theta$ 1/2	--	40	--	--	deg
Spectrum Line Halfwidth	$\Delta\lambda$	--	35	--	--	IF=20mA

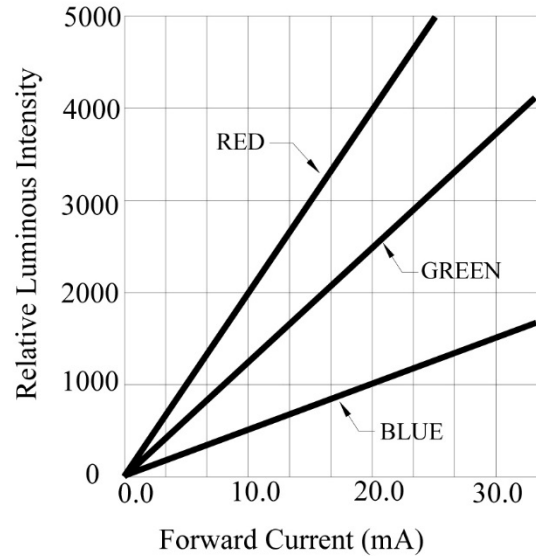
<b>Blue</b>						
<b>Parameter</b>	<b>Symbol</b>	<b>Min.</b>	<b>Typ.</b>	<b>Max.</b>	<b>Unit</b>	<b>Condition</b>
Forward Voltage Per Segment	<b>VF</b>	--	3.2	4.0	V	IF=20mA
Luminous Intensity	<b>Iv</b>	500	1000	--	mcd	IF=20mA
Dominant Wavelength	$\lambda d$	--	465	--	nm	IF=20mA
Reverse (Leakage) Current	<b>Ir</b>	--	--	50	nm	Vr=5V
Viewing Angle	2 $\theta$ 1/2	--	40	--	--	deg
Spectrum Line Halfwidth	$\Delta\lambda$	--	26	--	--	IF=20mA

- Notes: 1. IS tester used  
 2. Customer special requirements are welcomed.  
 3. Specifications subject to change without notice

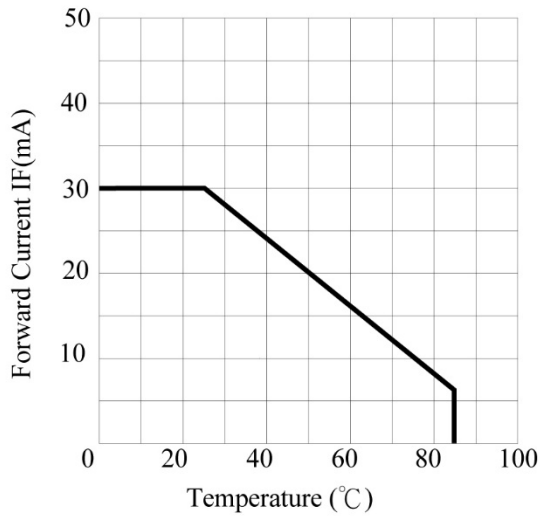
*Typical Electrical / Optical Characteristic Curves*



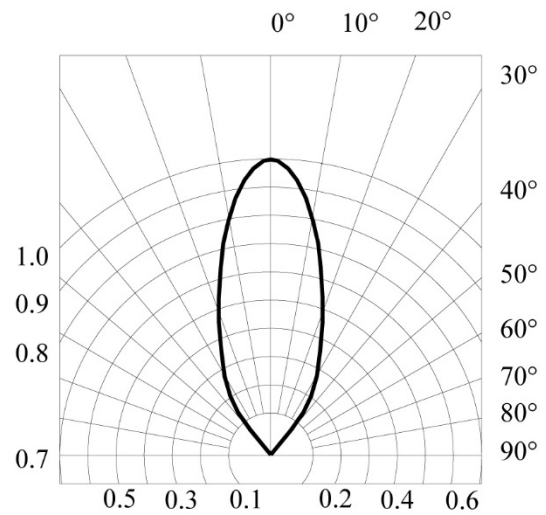
**FORWARD CURRENT VS. APPLIED VOLTAGE**



**FORWARD CURRENT VS. LUMINOUS INTENSITY**



**FORWARD CURRENT VS. AMBIENT TEMPERATURE**



**RADIATION DIAGRAM**

## ***Precautions For Use***

### 1. Temperature in use

Since the light generated inside the LED needs to be emitted to outside efficiently, a resin with high light transparency is used; therefore, additives to improve the heat resistance or moisture resistance (silica gel , etc) which are used for semiconductor products such as transistors cannot be added to the resin.

Consequently, the heat resistant ability of the resin used for LED is usually low; therefore, please be careful on the following during use.

Avoid applying external force, stress, and excessive vibration to the resins and terminals at high temperature. The glass transition temperature of epoxy resin used for the LED is approximately 120-130°C.

At a temperature exceeding this limit, the coefficient of linear expansion of the resin doubles or more compared to that at normal temperature and the resin is softened.

If external force or stress is applied at that time, it may cause a wire rupture.

### 2. Soldering

Please be careful on the following at soldering.

After soldering, avoid applying external force, stress, and excessive vibration until the products go to cooling process (normal temperature), <Same for products with terminal leads>

#### (1) Soldering measurements:

Distance between melted solder side to bottom of resin shall be 1.6mm or longer.

#### (2) Dip soldering :

Pre-heat: 90°C max. (Backside of PCB), Within 60 seconds.

Solder bath: 260±5°C (Solder temperature), Within 5 seconds.

#### (3) Hand soldering: 350°C max. (Temperature of soldering iron tip), Within 3 seconds.

### 3. Insertion

Pitch of the LED leads and pitch of mounting holes need to be same.

### 4. Others

Since the heat resistant ability of the LED resin is low, SMD components are used on the same PCB, please mount the LED after adhesive baking process for SMD components. In case adhesive baking is done after LED lamp insertion due to a production process reason, make sure not to apply external force, stress, and excessive vibration to the LED and follow the conditions below.

Baking temperature: 120°C max. Baking time: Within 60 seconds.

If soldering is done sequentially after the adhesive baking, please perform the soldering after cooling down the LED to normal temperature.

