

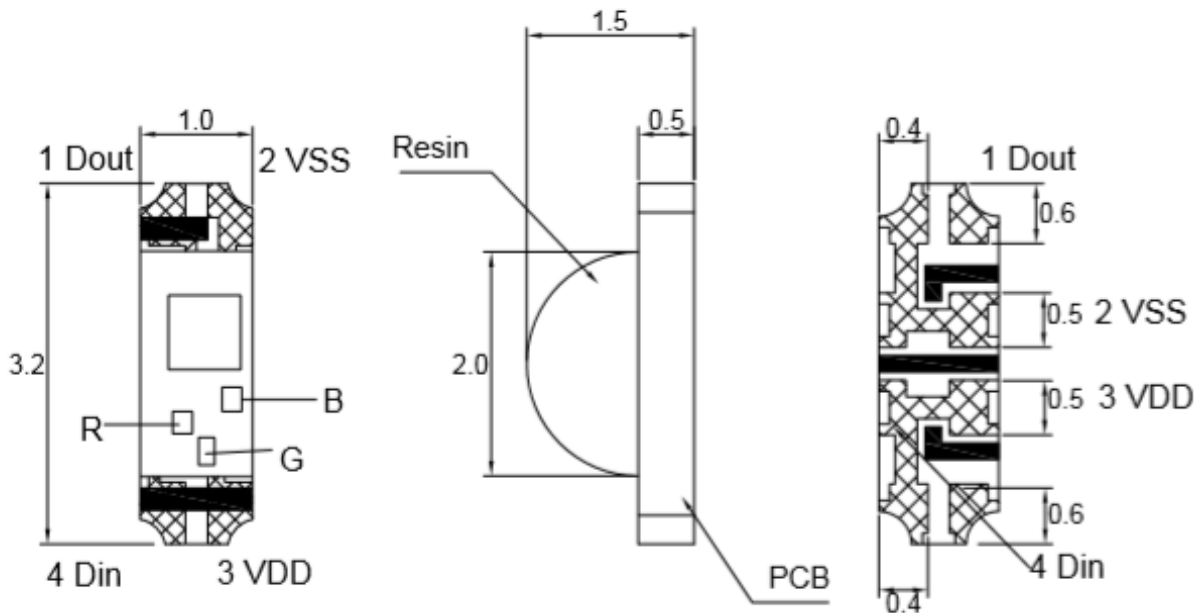


# American Opto Plus LED Corp.

## L121L-LEPGBC-3I

3.2 x 1.0 x 1.5mm RGB SMD LED with IC

### PACKAGE DIMENSION



NO.	Symbol	Function Description
1	DOUT	Control Date Signal Output
2	VSS	Ground
3	VDD	DC Power Input
4	DIN	Control Date Signal Input

#### Notes

1. All dimensions are in millimeters; tolerance is  $\pm 0.2\text{mm}$  unless otherwise noted
2. Specifications are subject to change without notice

Material	Color	
	Emitted	Lens
AlGaInP	Red	White Diffused
InGaN	Blue	
InGaN	Green	

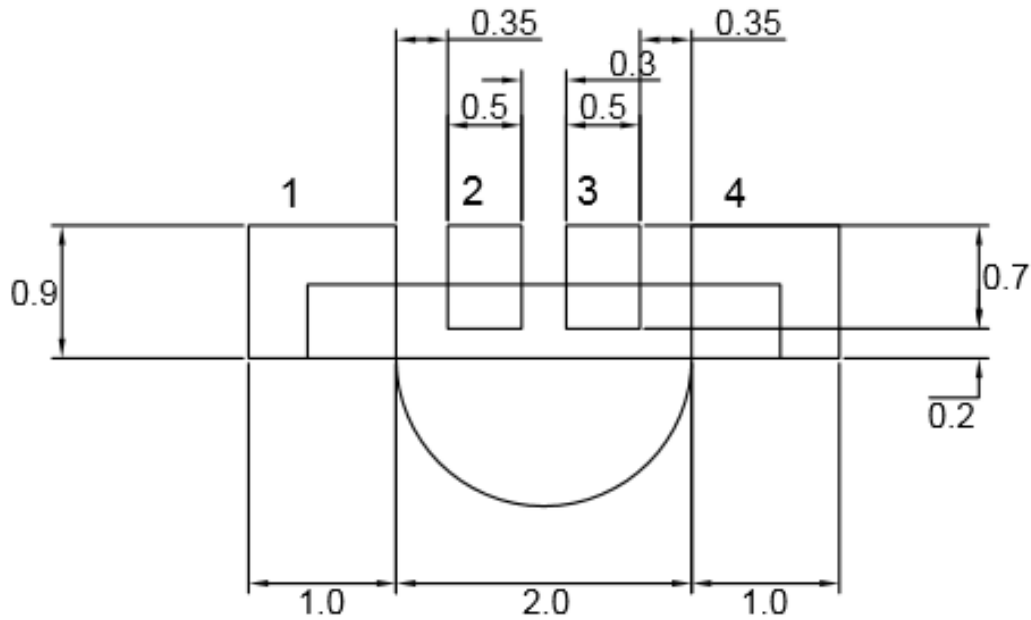


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### RECOMMENDED SOLDERING PAD DIMENSIONS



Notes: The tolerances unless mentioned is  $\pm 0.1$ mm, Angle  $\pm 0.5$ . Unit=mm.



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### ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	VDD	-0-6.0	V
LED Output Current	I <sub>OUT</sub>	25	mA
Operating Temperature	T <sub>OPR</sub>	-40~+85	°C
Storage Temperature	T <sub>STG</sub>	-40~+100	°C
Power Dissipation	PD	400	mW

### TYPICAL-ELECTRICAL CHARACTERISTICS

(Ta=25°C)

Parameter	Symbol	Test Condition	Rating			Unit
			Min.	Typ.	Max.	
Supply Voltage	VDD	--	3.3	5	5.5	V
Each RGB Current	IOL	VDD=5V	--	5	--	mA
Input High Voltage	VIH	DI	2.7	--	VDD	V
Input Low Voltage	VIL	DI	0	--	1.0	V
Output High Voltage	VOH	DO,@VDD=5V	4.5	--	--	--
Output Low Voltage	VOL	DO,@VDD=5V	--	--	0.4VDD	V
Operation Current	IDD	B,G,R no load	--	--	2	mA
Pull Down Resistance	R <sub>PD</sub>	Din, Dout(VDD=5V)	--	500K	--	Ω

### ELECTRICAL OPTICAL CHARACTERISTICS AT

(Ta=25°C)

Items	Symbol	Min.	Typ.	Max.	Unit	Condition	
Dominant Wavelength	λ <sub>d</sub>	R	-	622	-	nm	VDD=5.0V
		G	-	525	-		
		B	-	470	-		
Luminous Intensity	I <sub>v</sub>	R	--	60	--	mcd	
		G	--	150	--		
		B	--	35	--		
Viewing Angle	2θ1/2	-	120	-	deg		

Note:

1. The dominant wavelength data did not including ±1 nm testing tolerance.
2. The luminous intensity data did not including ±15% testing tolerance.

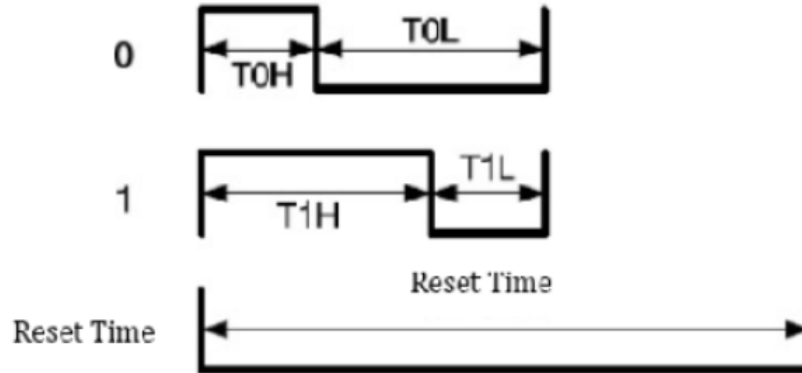


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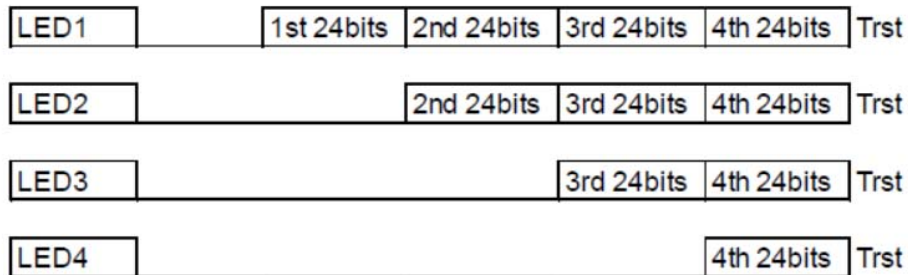
### TIMING WAVE FORM



### HIGH SPEED MODE

Item	Description	Min.	Typical	Allowance	Unit
TOH	0 code, High- level time	-	0.3	±0.15	us
TOL	0 code, Low- level time	-	0.9	±0.15	us
T1H	1 code, High- level time	-	0.9	±0.15	us
T1L	1 code, Low- level time	-	0.3	±0.15	us
Trst	Rest code, Low- level time	250	--	--	--

### DATA COMMUNICATION



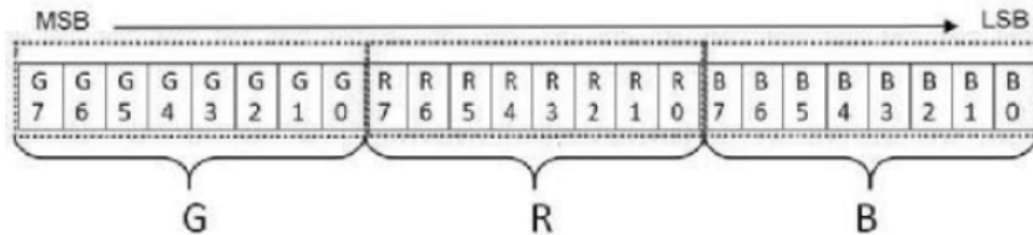


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### SINGAL DATA IN 24BIT FOR RGB



### ADVANCE FUCNTION MODE

This product has a Advance Function Mode that supports the MCU to start with a specific command setting.

1. Freedback the cascaded number of LEDs and maximum sink current of R/G/B channel
2. Current Gain control:32 level(5bits) to adjust maximum sink current of R/G/B channel
3. Programmable PWM refresh rate (1.25kHz/2.5kHz/5Khz/10kHz)



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### TYPICAL ELECTRO-OPTICAL CHARACTERISTICS CURVE

Fig.1 R CHIP  
Relative Intensity vs. Wavelength

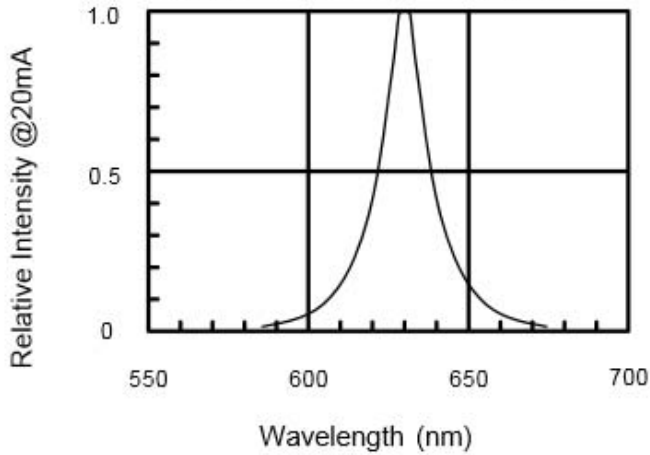


Fig.2 G CHIP  
Relative Intensity vs. Wavelength

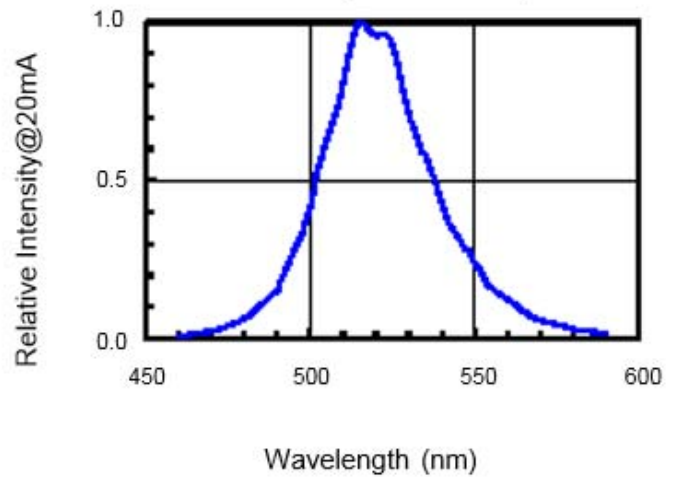


Fig.3 B CHIP  
Relative Intensity vs. Wavelength

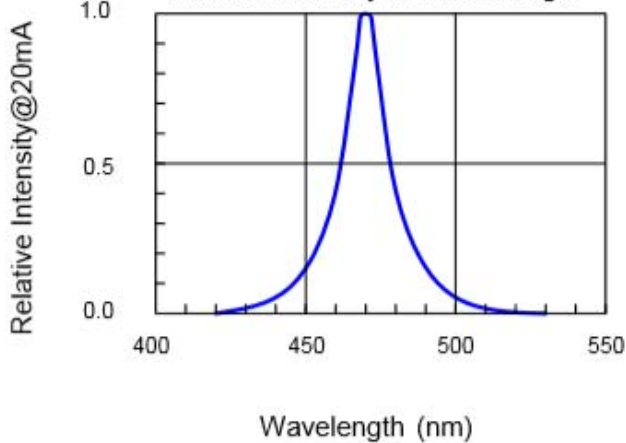
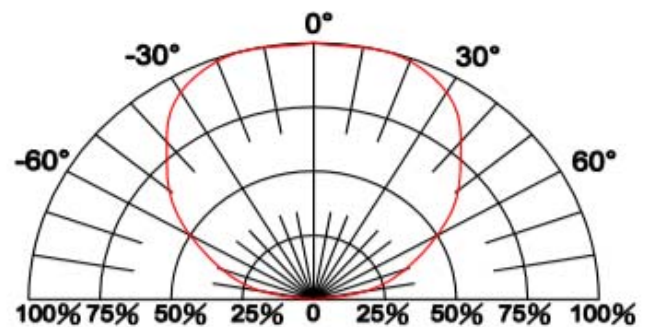


Fig.4 Directive Radiation



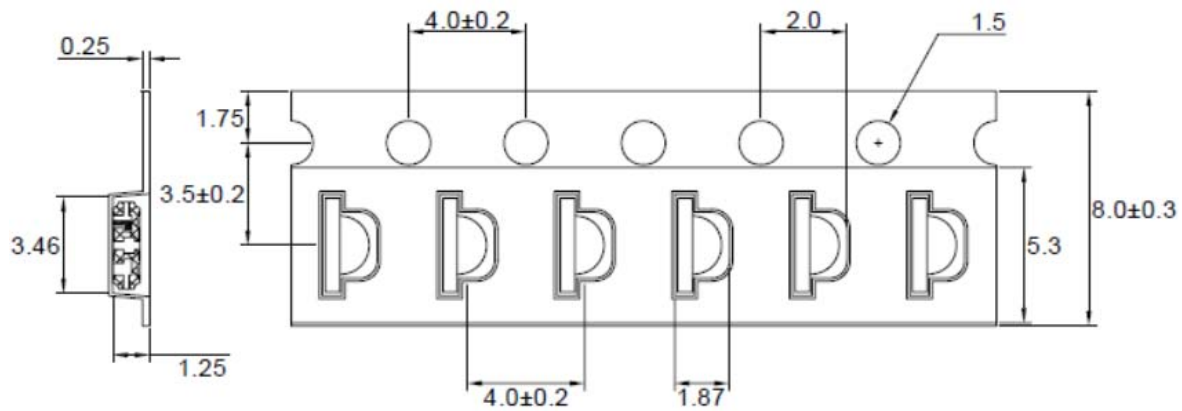


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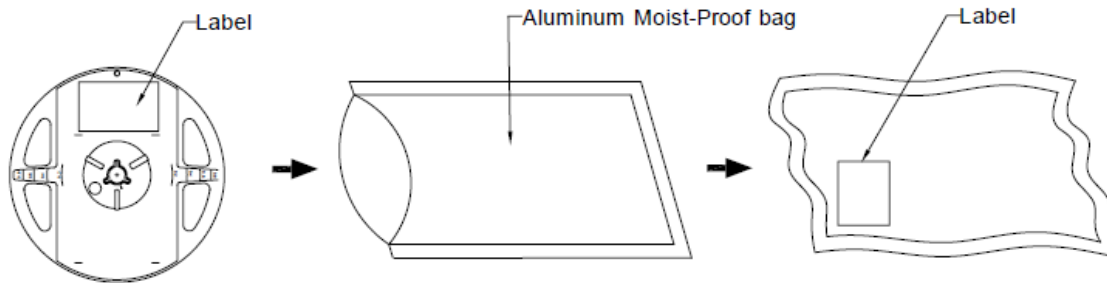
### CARRIER TAPE DIMENSION



#### Notes:

1. Tolerance is  $\pm 0.1$ mm; angle is  $\pm 0.5$  unless otherwise mentioned

### PACKING SPECIFICATIONS



#### Notes:

1. 8.0 mm tape, 7" reel
2. 3000 pcs/ reel

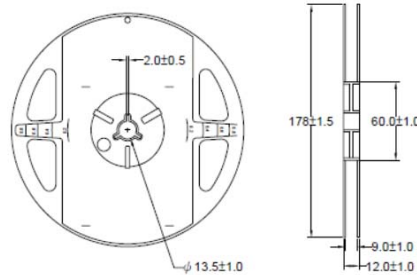


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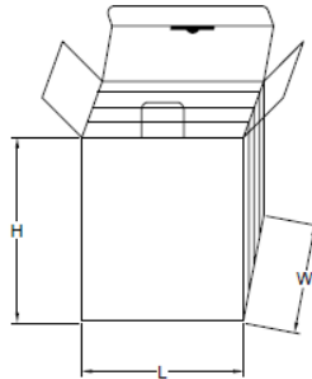
## L121L-LEPGBC-3I

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### REEL DIMENSIONS

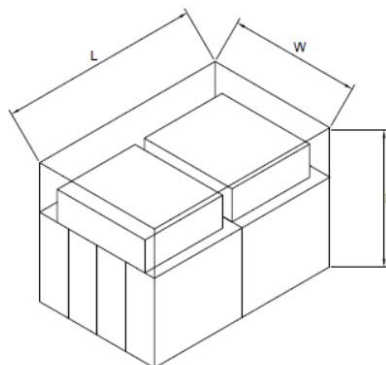


### BOX EXPLANATION



#### Notes:

1. 5 BAG / INNER BOX
2. Inner box size : L X W X H 23cm X 8.5cm x 26cm



#### Notes:

1. 10 INNER BOXES / CARTON
2. Carton size : L X W X H 58cm X 34cm x 35cm





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## L121L-LEPGBC-3I

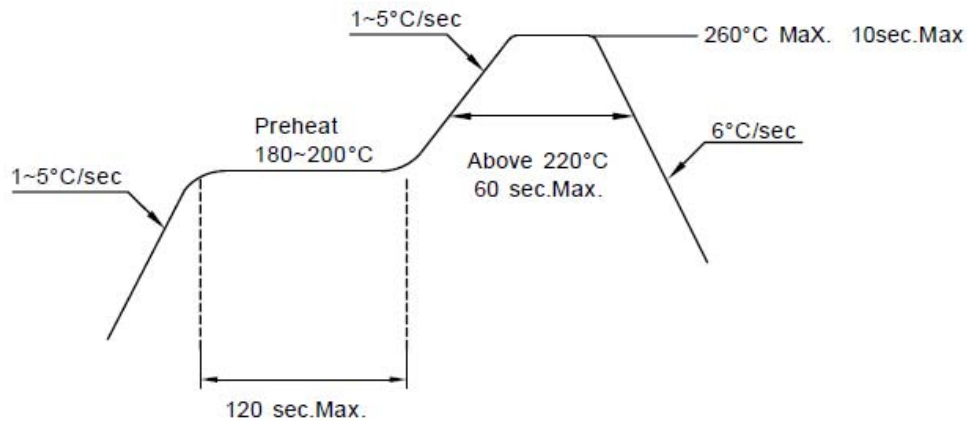
3.2 x 1.0 x 1.5mm RGB SMD LED with IC

### RECOMMENDED SOLDERING CONDITION

#### 1. Hand Solder

Basic spec is  $\leq 280^{\circ}\text{C}$  for 3 seconds one time only

#### 2. PB-Free Reflow Solder



#### Notes:

1. Reflow soldering should not be done more than 2 times
2. When soldering, do not put stress on the LEDs during heating
3. After soldering, do not warp the circuit board



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### PRECAUTION

#### Storage Time:

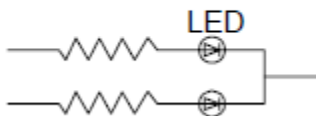
1. Calculated shelf life before opening is 12 months at  $<30^{\circ}\text{C}$  and  $< 90\%$  relative humidity(RH)
2. After bag is opened, devices which will be subjected to reflow soldering or other high temperature processes must be
  - a. Assembled within 168 hours in an environment of  $\leq 30^{\circ}\text{C}/60\%$  RH or
  - b. Stored at ambient of 10% RH or less
3. Devices are required baking before assembly if:
  - a. Humidity indicator card reads  $>10\%$ (for level 2a-5a) or  $>60\%$ (for level 2) at ambient temperature  $23\pm 5^{\circ}\text{C}$
  - b. 2.a) or 2.b) doesn't meet
4. If baking is required, devices should be baked for  $>24$  hours at  $60\pm 5^{\circ}\text{C}/5\%$  RH. Performing baking only once and using baked devices within 8 hours

#### Drive method:

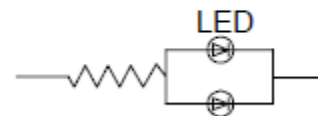
LED is a current operated device and therefore require some kind of current limiting incorporated into the

driver circuit. This current limiting typically takes the form of a current limiting resistor places in series with the LED. Consider worst case voltage variations than could occur across the current limiting resistor. The forward current should not be allowed to change by more than 40% of its desired value

Circuit model A



Circuit model B



- a. Recommended circuit
- b. The difference of brightness between LED could be found due to the VF-IF characteristics of LED

#### Cleaning:

1. Use alcohol based cleaning solvents such as isopropyl alcohol to clean the LED

#### Electrostatic Discharge(ESD)

1. Static electricity or power surge will damage the LED. Use of a conductive wrist band or anti-electrostatic glove is recommended when handling these LED. All devices, equipment and machinery must be properly grounded