

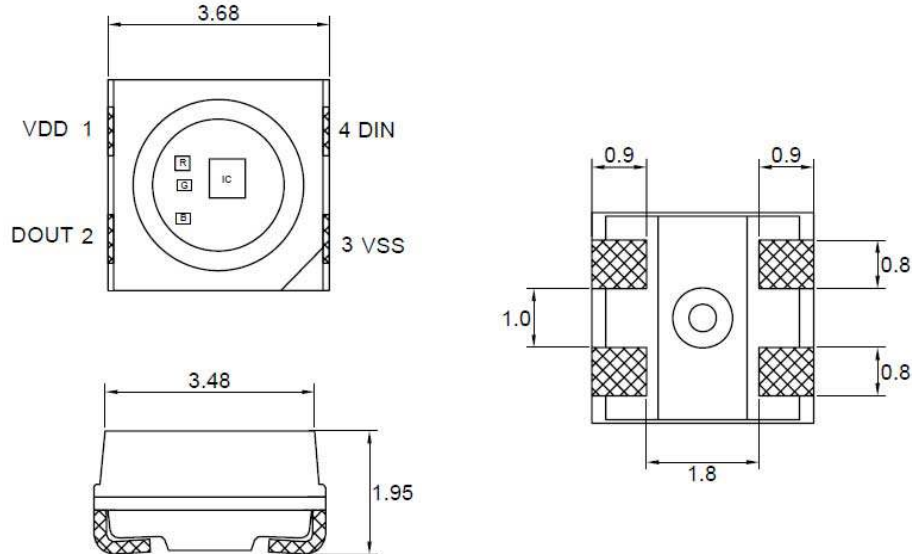


# American Opto Plus LED Corp.

## L993L-LEPGBC-3I

3.68 x 3.68 x 1.95mm RGB SMD LED with IC

### PACKAGE DIMENSION



### Notes

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

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

Material	Color	
	Emitted	Lens
AlGaInP	Red	Water Clear
InGaN	Blue	
InGaN	Green	

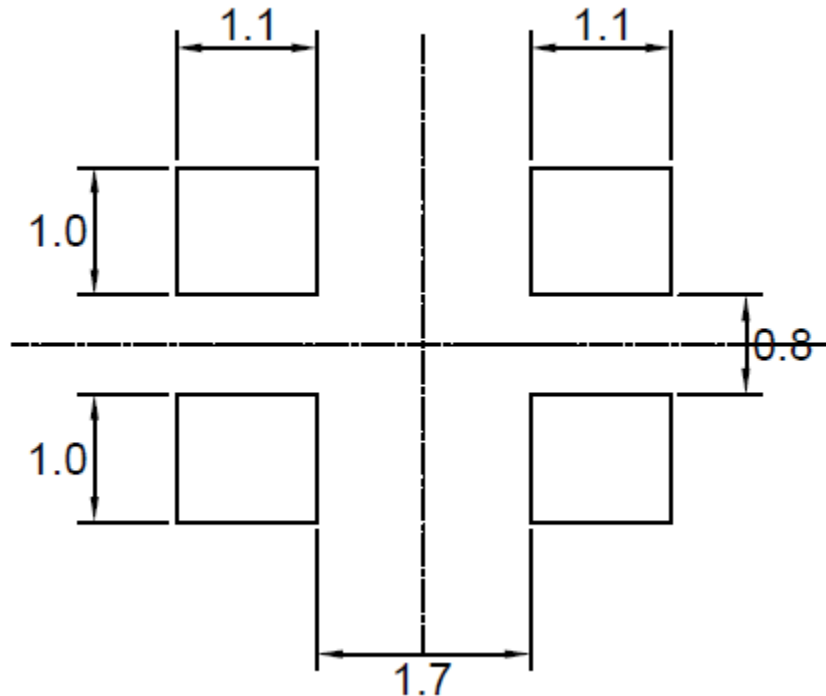


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### RECOMMENDED SOLDERING PAD



#### Note:

1. The tolerance 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>	20	mA
Operating Temperature	T <sub>OPR</sub>	-40~+85	°C
Storage Temperature	T <sub>STG</sub>	-40~+100	°C

### 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	--	12	--	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

### ELECTRICAL OPTICAL CHARACTERISTICS AT

(Ta=25°C)

Parameter	Symbol		Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I <sub>v</sub>	R	--	500	--	mcd	VDD=5.0V
		G	--	650	--		
		B	--	190	--		
Dominant Wavelength	λ <sub>d</sub>	R	--	622	--	nm	
		G	--	525	--		
		B	--	470	--		
Viewing Angle	2θ1/2		--	--	--	--	

Note:

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

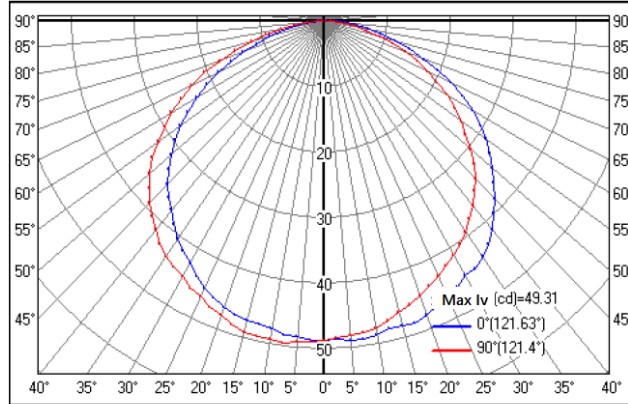


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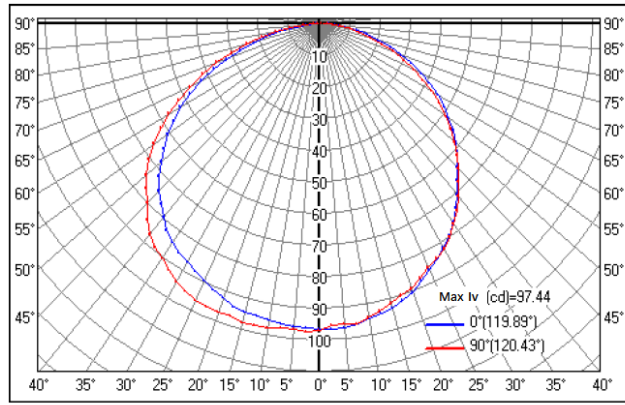
## L993L-LEPGBC-3I

3.68 x 3.68 x 1.95mm RGB SMD LED with IC

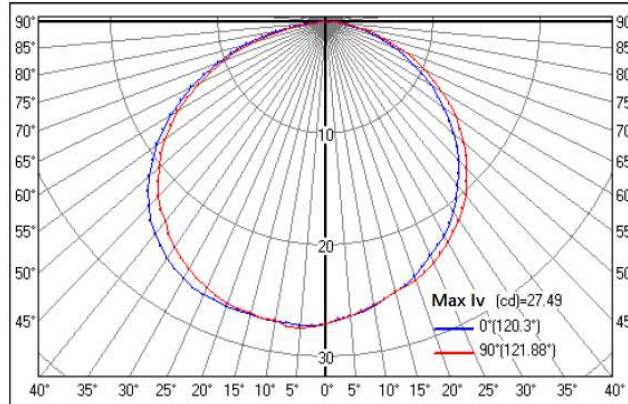
### SPATIAL DISTRIBUTION GRAPH ( RED )



### SPATIAL DISTRIBUTION GRAPH ( GREEN )



### SPATIAL DISTRIBUTION GRAPH ( BLUE )



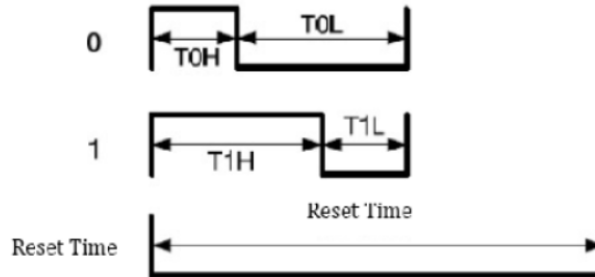


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## L993L-LEPGBC-3I

3.68 x 3.68 x 1.95mm RGB SMD LED with IC

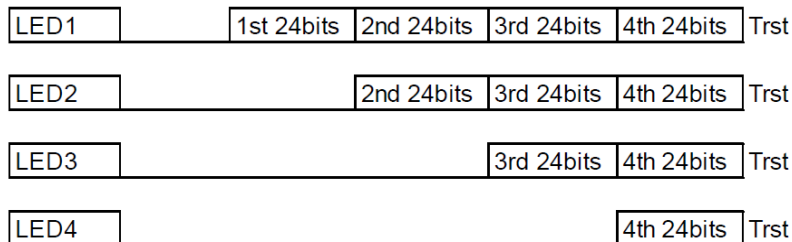
### TRIMING WAVE FORM



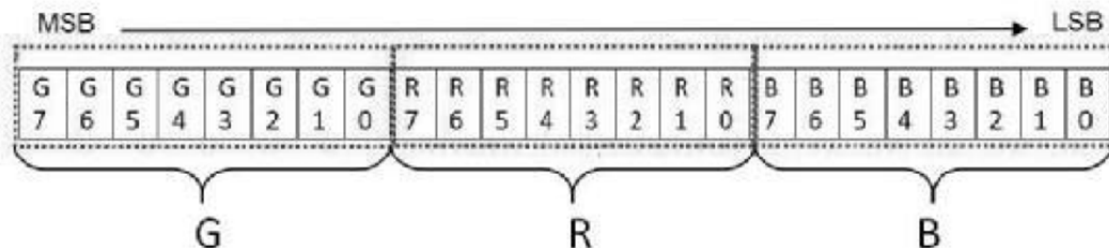
### HIGH SPEED MODE

Item	Description	Min.	Typical	Allowance	Unit
T0H	0 code, High- level time	--	0.3	±0.15	us
T0L	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	--	--	us

### DATA COMMUNICATION



### SINGAL DATA IN 24BIT FOR RGB



### ADVANCE FUNCTION MODE

This Product has an advance function mode that supports the MCU to start with specific command setting. Advance function mode includes the following function:

1. Feedback the cascaded number of LEDs and maximum sink current of R/G/B channel.
2. Current gain control: 32 level (5 bits) to adjust maximum sink current of R/G/B channel.
3. Programmable PWM refresh rate (1.5kHz/2.5kHz/5kHz/10kHz).

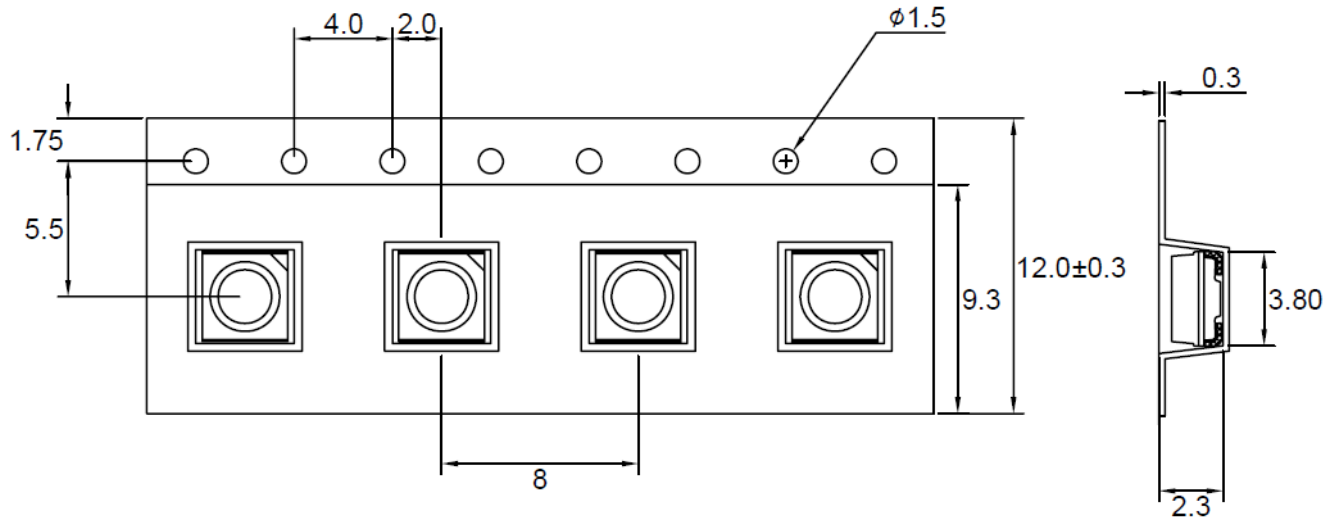


# American Opto Plus LED Corp.

## L993L-LEPGBC-3I

3.68 x 3.68 x 1.95mm RGB SMD LED with IC

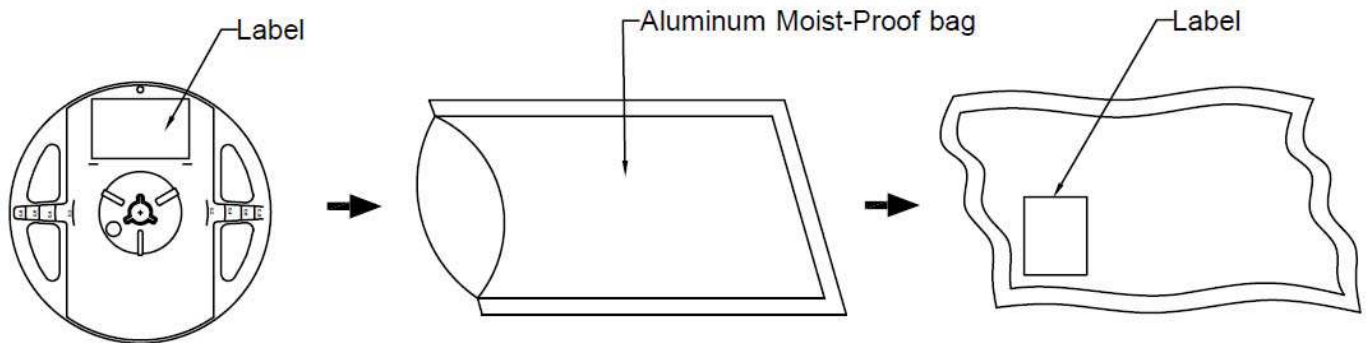
### CARRIER TAPE DIMENSION



#### Notes:

1. The tolerance unless mentioned is  $\pm 0.1$ mm; angle is  $\pm 0.5$ , unit=mm.

### PACKING SPECIFICATIONS



#### Notes:

1. 12.0 mm tape, 7" reel.
2. 500 pcs/ reel.

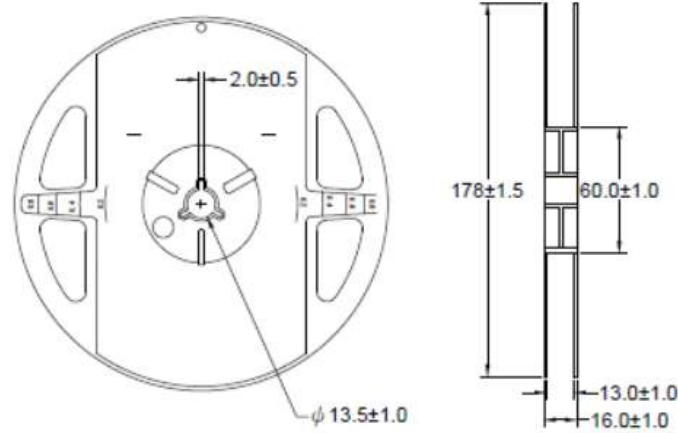


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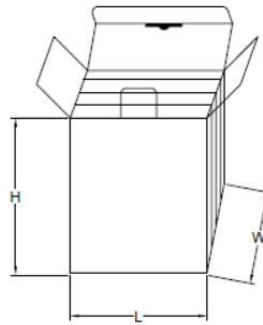
## L993L-LEPGBC-3I

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### REEL DIMENSIONS

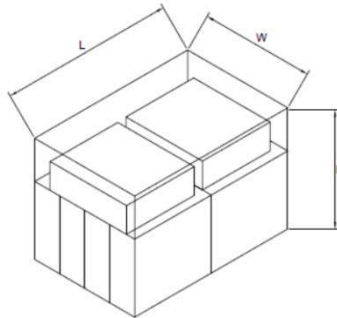


### BOX EXPLANATION



#### 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



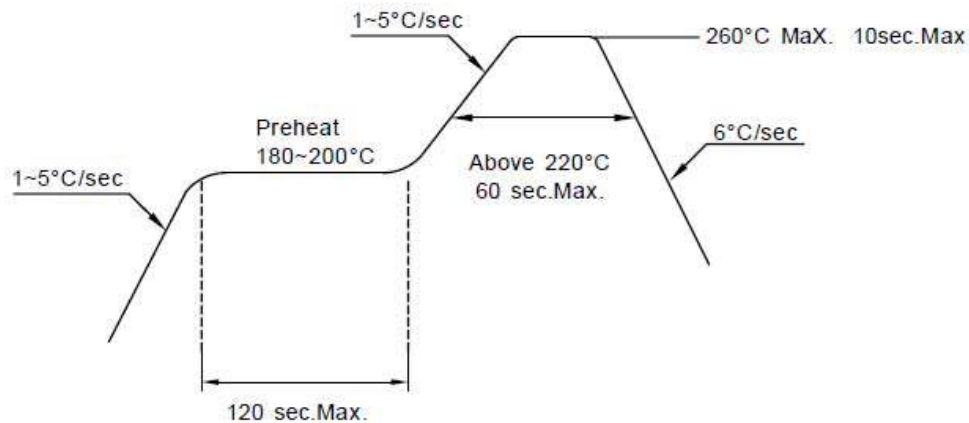
# American Opto Plus LED Corp.

## L993L-LEPGBC-3I

3.68 x 3.68 x 1.95mm 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.





# American Opto Plus LED Corp.

## L993L-LEPGBC-3I

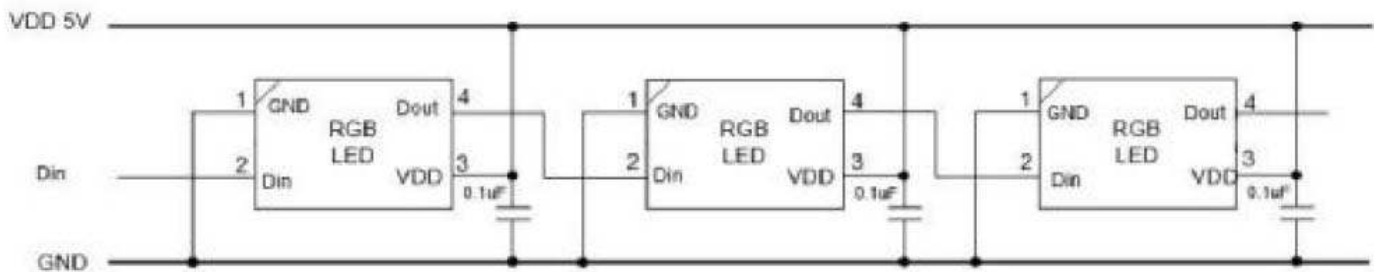
3.68 x 3.68 x 1.95mm RGB SMD LED with IC

### PRECAUTION FOR USE

#### 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 72 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.

### RECOMMENDED ROUTE



### CLEANING

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

### ELECTROSTATIC DISCHARGE(ESD)

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.