

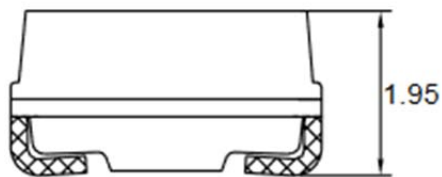
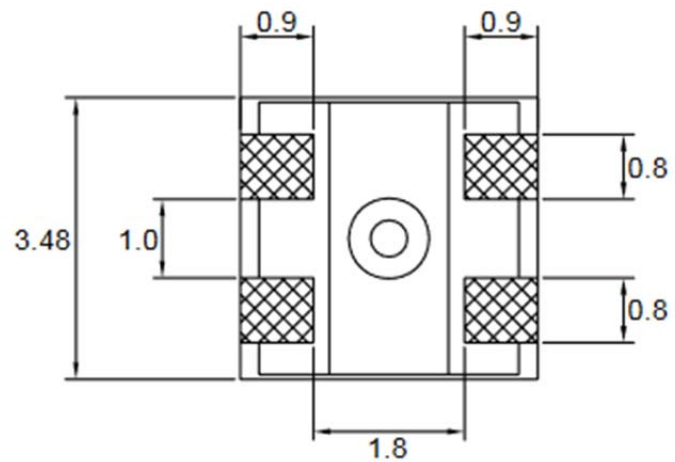
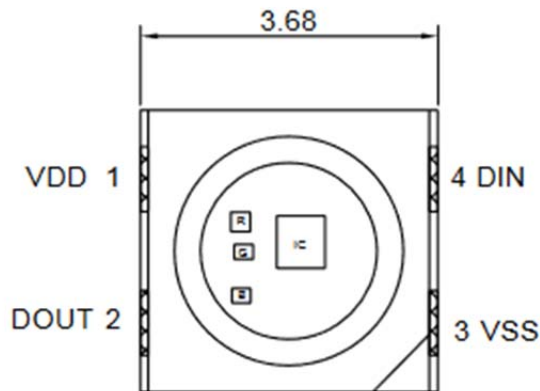


# American Opto Plus LED Corp.

## L993L-QEPGBC-3I

3.68 x 3.48 x 1.95mm RGB SMD LED with IC (3535 Package)

### PACKAGE DIMENSION



NO.	Symbol	Function Description
1	VDD	DC power input
2	DOUT	Control data signal output
3	VSS	Ground
4	DIN	Control data signal input

### Notes:

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

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

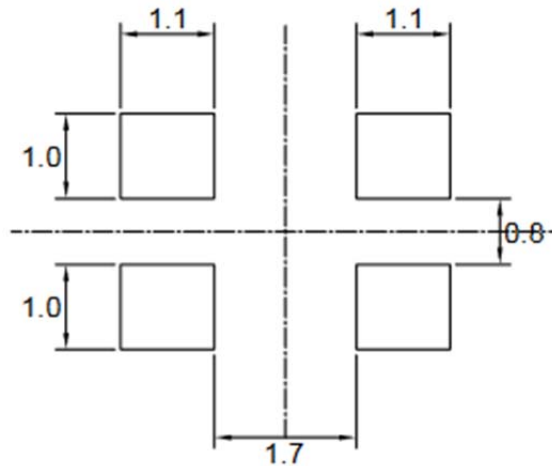


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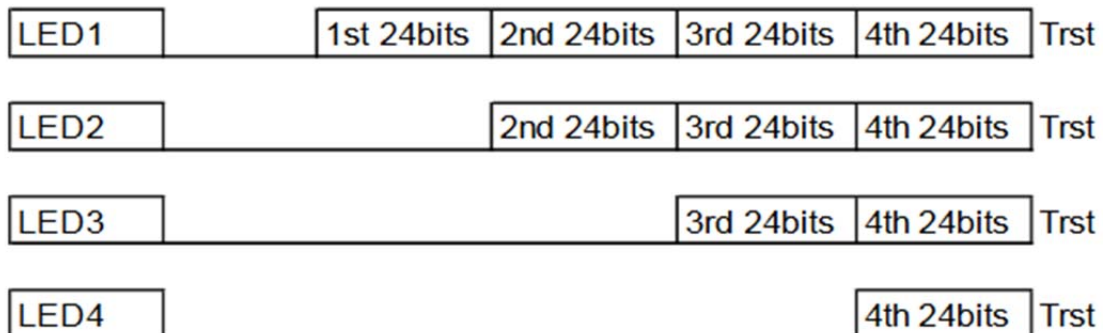
### RECOMMENDED SOLDERING PAD PATTERN



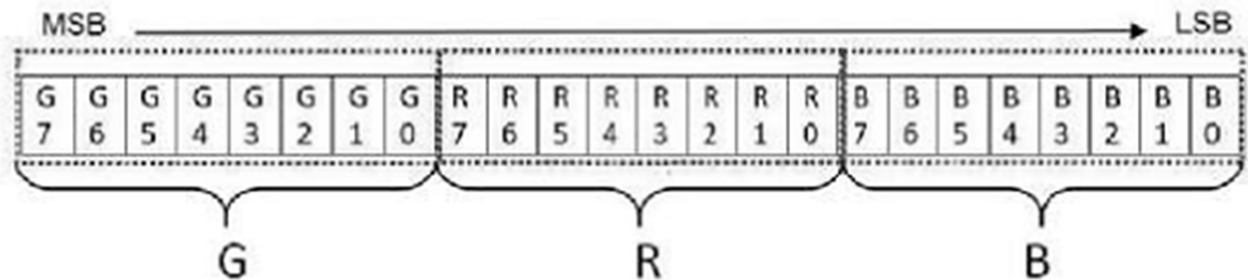
#### Notes:

1. The tolerances unless mentioned is  $\pm 0.1\text{mm}$ , angle  $\pm 0.5^\circ$ .
2. Unit = mm.

### DATA COMMUNICATION



### SINGLE DATA IN 24BIT FOR RGB



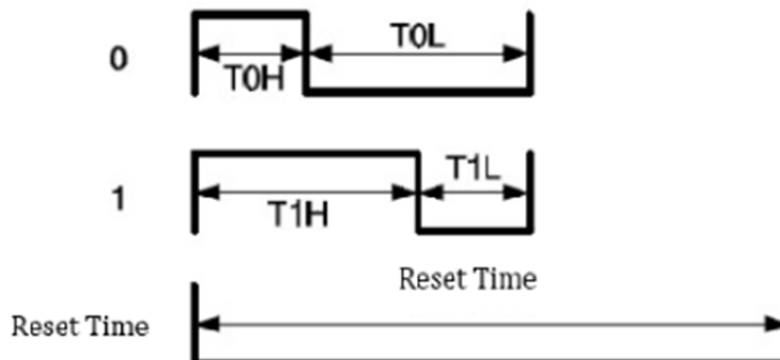


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### TIMING WAVE FORM



### HIGH SPEED MODE

Item	Description	Min.	Max.	Unit
TOH	0 code, High- level time	0.22	0.38	us
TOL	0 code, Low- level time	0.58	1	us
T1H	1 code, High- level time	0.58	1	us
T1L	1 code, Low- level time	0.22	1	us
Trst	Rest code, Low- level time	280	--	us

Note: TH+TL>1.2us.



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### ABSOLUTE MAXIMUM RATINGS

(Ta=25°C, VDD=5V, Vss=0)

Parameter	Symbol	Value	Unit
Supply Voltage	VDD	6.0	V
LED Output Current	Iout	20	mA
Operating Temperature Range	Topr	-40~+85	°C
Storage Temperature Range	Tstg	-40~+100	°C

### OPTICAL-ELECTRICAL CHARACTERISTICS

(Ta=25°C, VDD=5V, Vss=0)

Parameter	Symbol	Test Condition	Value			Unit
			Min	Typ	Max	
Supply Voltage	VDD	--	3.3	5	5.5	V
Each R/G/B 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	--	--	V
Output Low Voltage	VOL	DO@VDD=5V	--	--	0.4 VDD	V

### ELECTRICAL OPTICAL CHARACTERISTICS

Parameter	Symbol		Test Condition	Value			Unit
				Min	Typ	Max	
Luminous intensity	Iv	R	VDD=5V	320	500	1250	mcd
		PG		500	1000	1600	
		B		125	200	500	
Dominant Wavelength	λD	R		615	622	630	nm
		PG		515	523	530	
		B		460	467	475	
Viewing angle	2θ ½			--	120	--	Deg

#### Notes:

1. The dominant wavelength data did not including  $\pm 1\text{nm}$  testing tolerance.
2. The luminous intensity data did not including  $\pm 15\%$  testing tolerance.

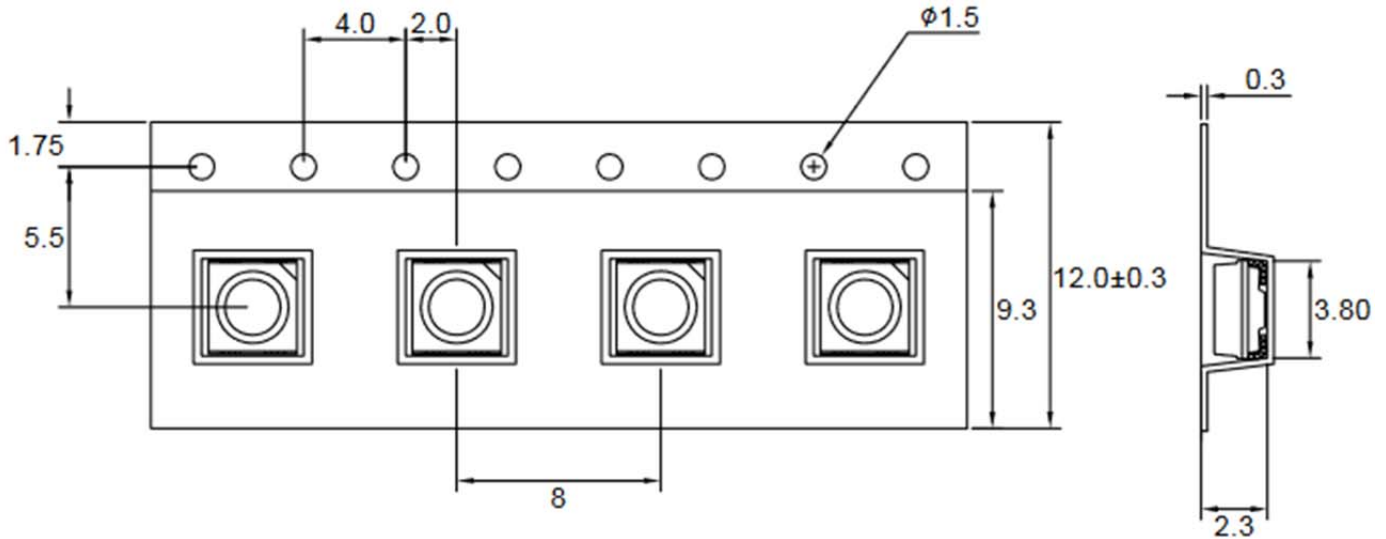


# American Opto Plus LED Corp.

## L993L-QEPGBC-3I

3.68 x 3.48 x 1.95mm RGB SMD LED with IC (3535 Package)

### CARRIER TAPE DIMENSIONS



#### Note:

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

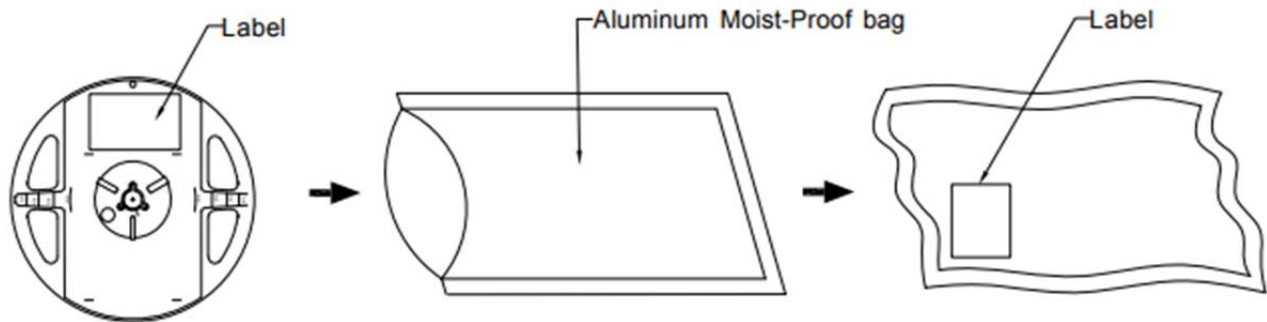
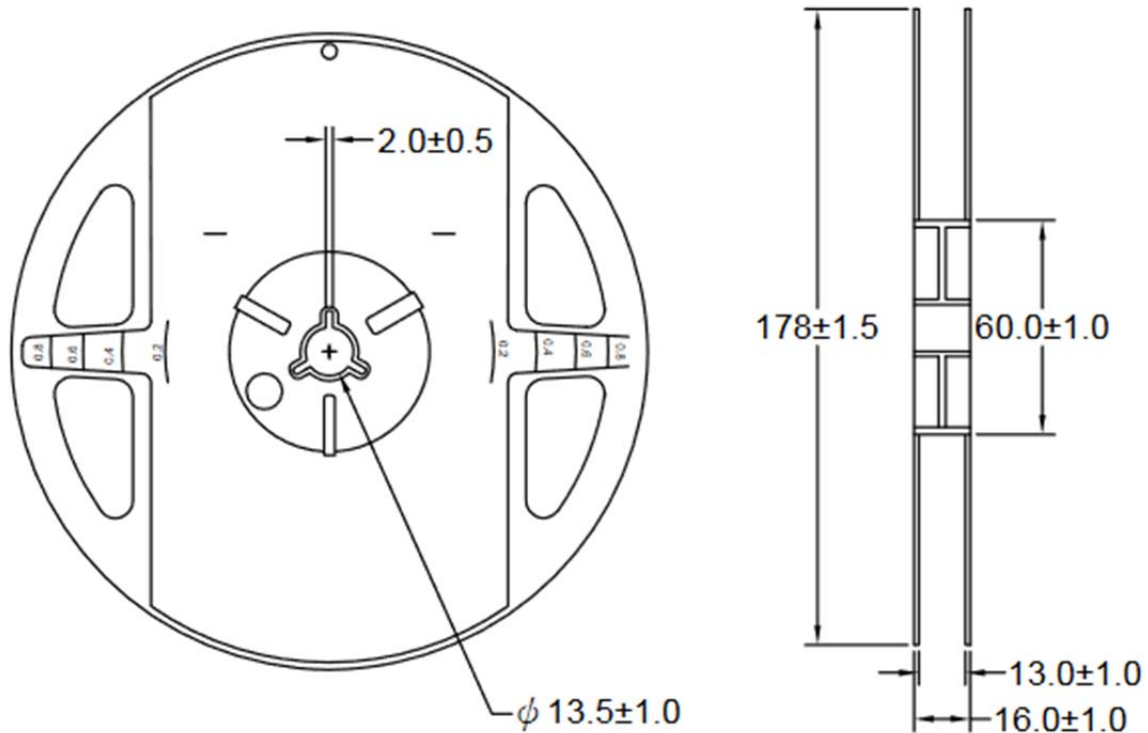


# American Opto Plus LED Corp.

## L993L-QEPGBC-3I

3.68 x 3.48 x 1.95mm RGB SMD LED with IC (3535 Package)

### REEL DIMENSIONS



Description	Quantity/Reel
12.0mm tape, 7" reel	500 PCS

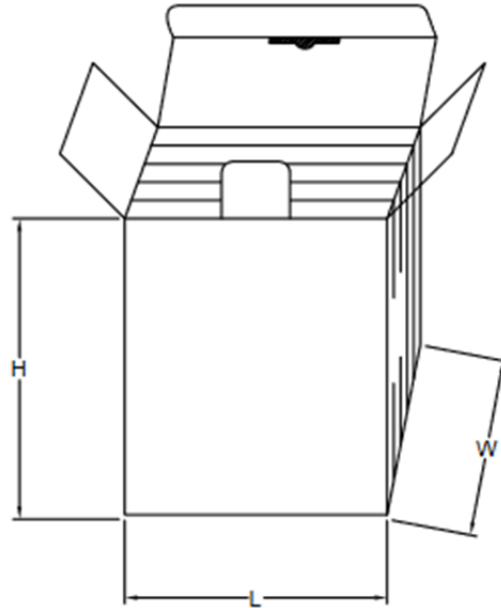


# American Opto Plus LED Corp.

## L993L-QEPGBC-3I

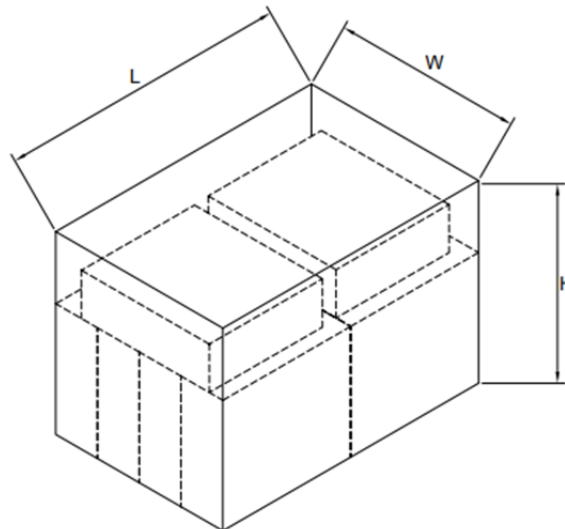
3.68 x 3.48 x 1.95mm RGB SMD LED with IC (3535 Package)

### BOX EXPLANATION



Notes:

1. 5 bag/inner box
2. Carton 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-QEPGBC-3I

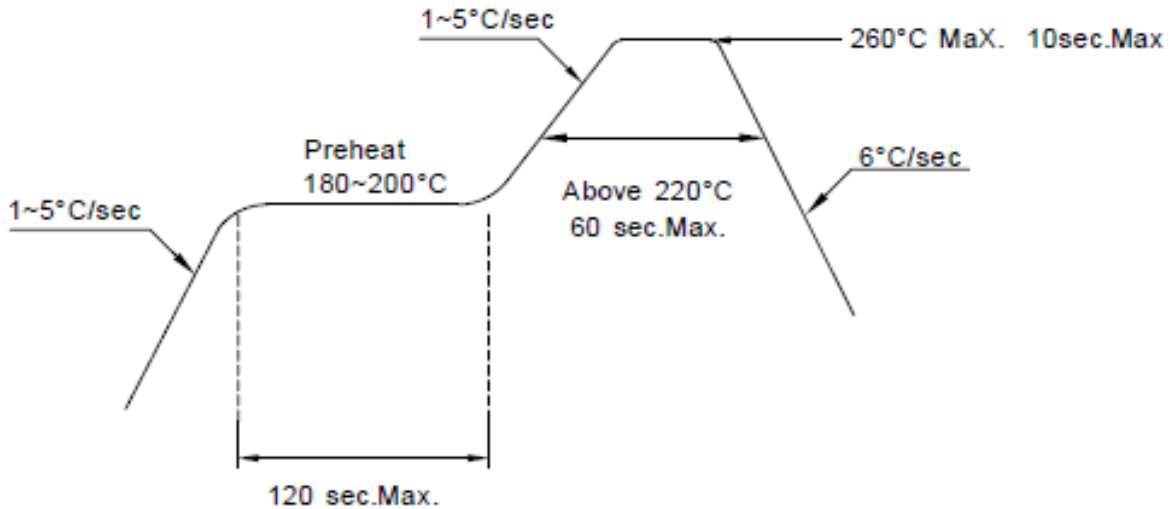
3.68 x 3.48 x 1.95mm RGB SMD LED with IC (3535 Package)

### RECOMMENDED SOLDERING CONDITIONS

#### 1. Hand Solder

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

#### 2. PB-Free Reflow Solder



#### Note:

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





# American Opto Plus LED Corp.

## L993L-QEPGBC-3I

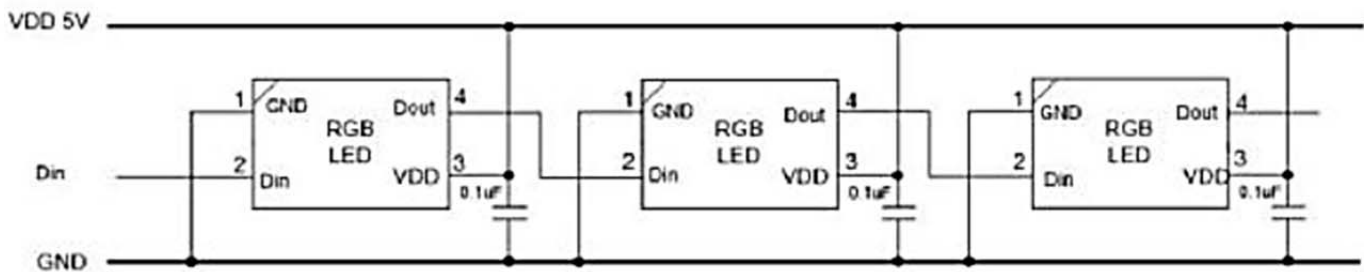
3.68 x 3.48 x 1.95mm RGB SMD LED with IC (3535 Package)

### PRECAUTIONS 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 the baked devices within 8 hours.

#### Recommended Route



#### Cleaning:

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

#### ESD (Electrostatic Discharge):

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.