

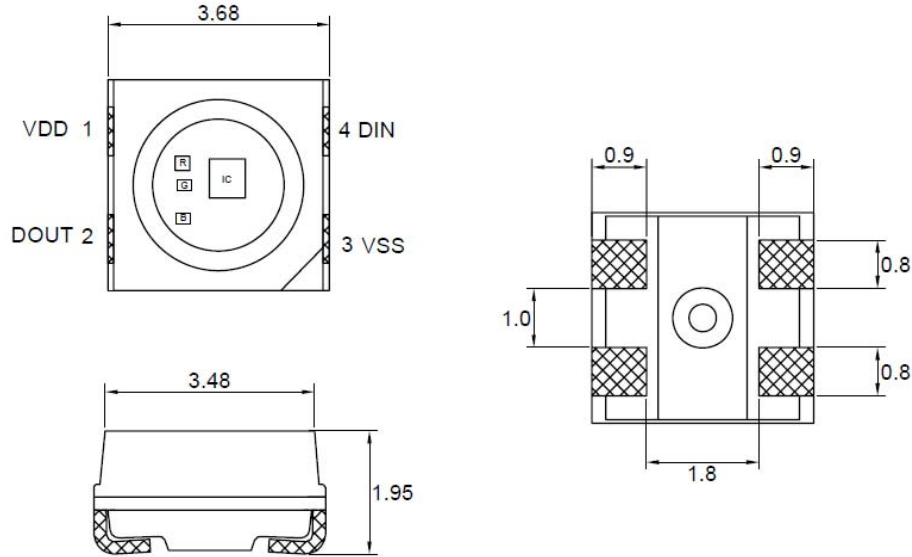


American Opto Plus LED Corp.

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 ± 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	

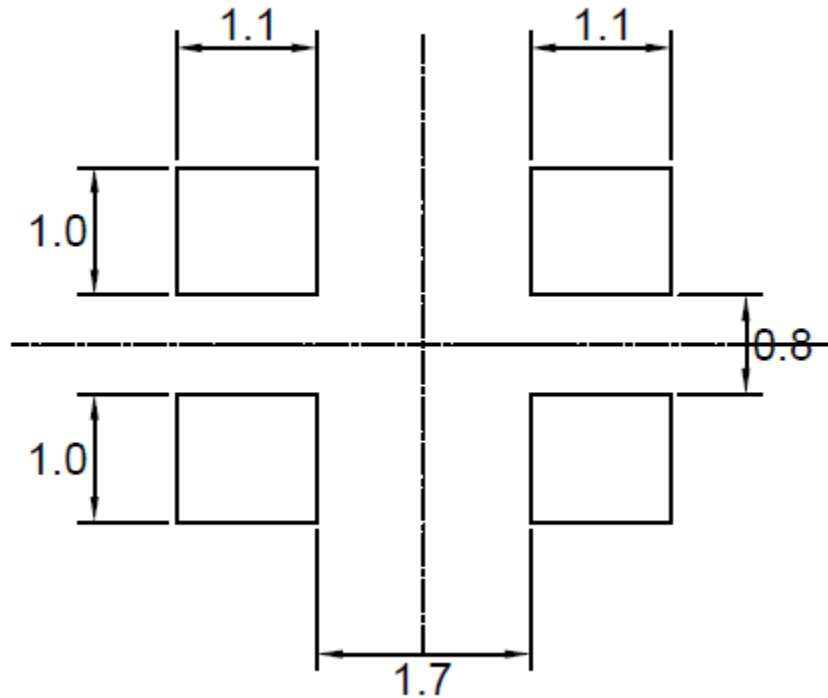


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RECOMMENDED SOLDERING PAD



Note:

1. The tolerance unless mentioned is ± 0.1 mm, Angle ± 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 _{OUT}	20	mA
Operating Temperature	T _{OPR}	-40~+85	°C
Storage Temperature	T _{STG}	-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 _v	R	--	500	--	mcd	VDD=5.0V
		G	--	650	--		
		B	--	190	--		
Dominant Wavelength	λ _d	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.

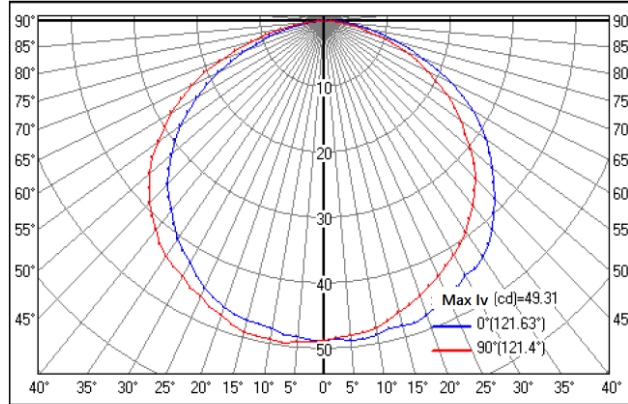


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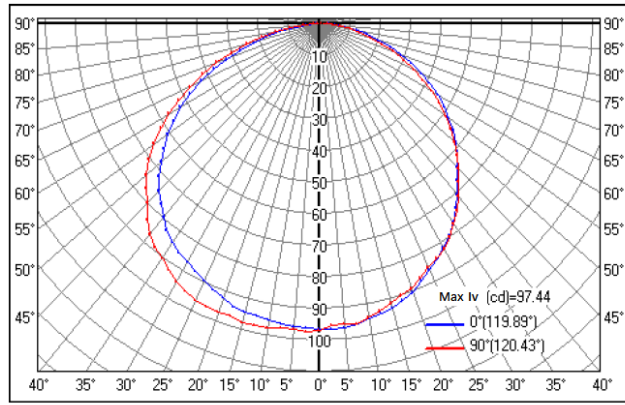
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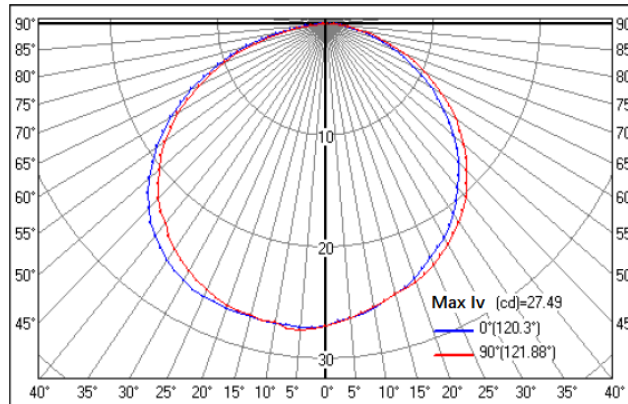
SPATIAL DISTRIBUTION GRAPH (RED)



SPATIAL DISTRIBUTION GRAPH (GREEN)



SPATIAL DISTRIBUTION GRAPH (BLUE)



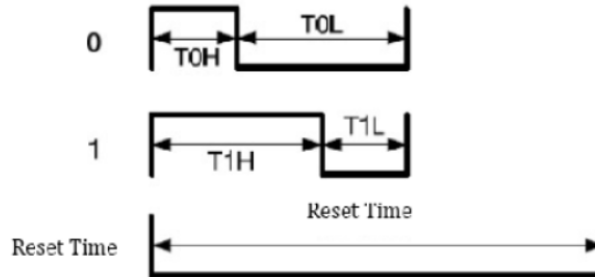


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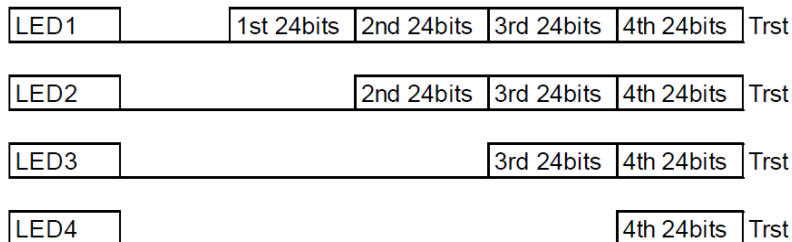
TRIMING WAVE FORM



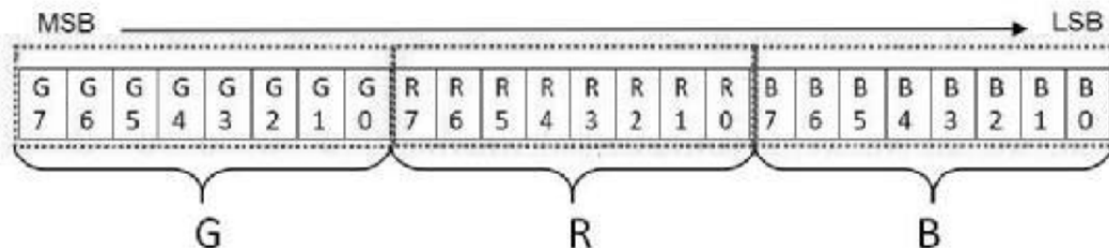
HIGH SPEED MODE

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).

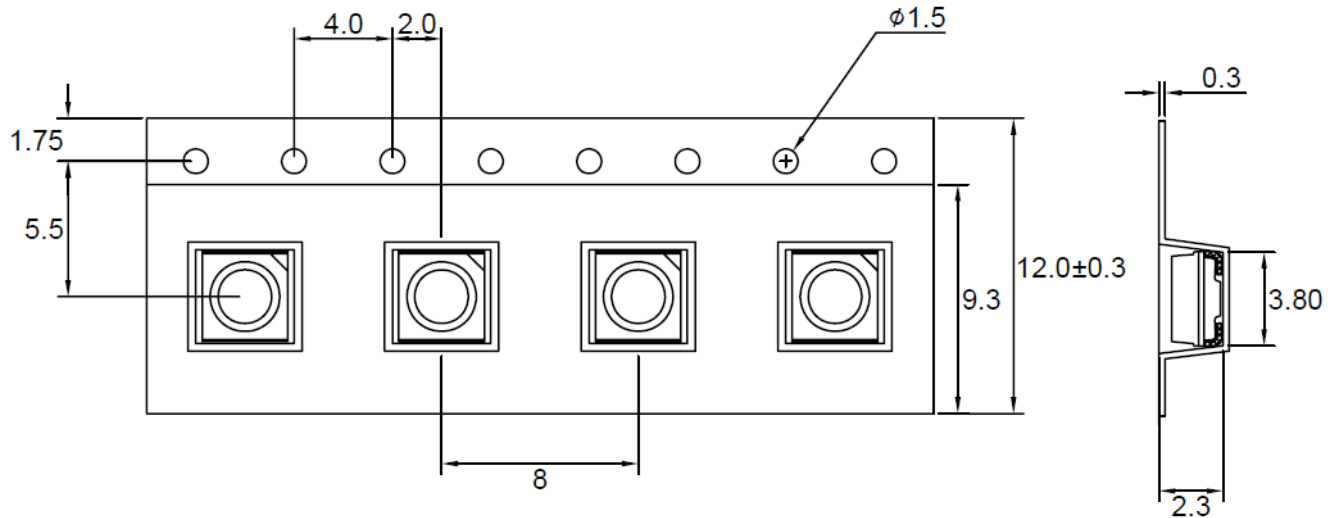


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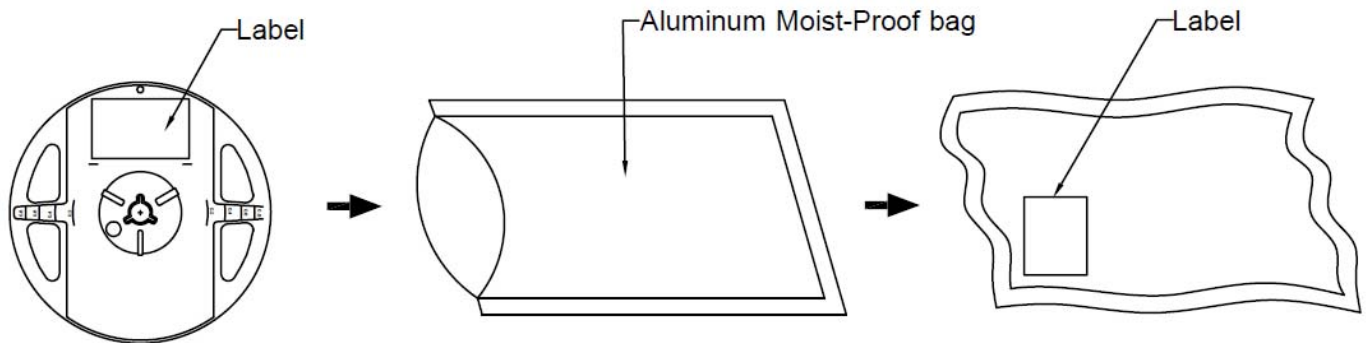
CARRIER TAPE DIMENSION



Notes:

1. The tolerance unless mentioned is ± 0.1 mm; angle is ± 0.5 , unit=mm.

PACKING SPECIFICATIONS



Notes:

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

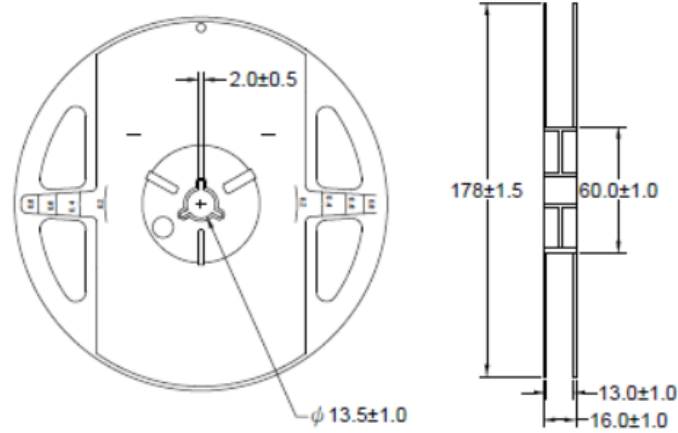


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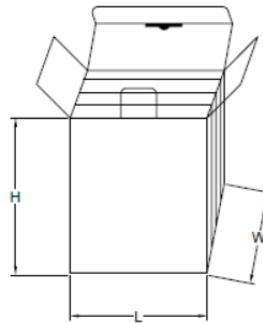
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REEL DIMENSIONS

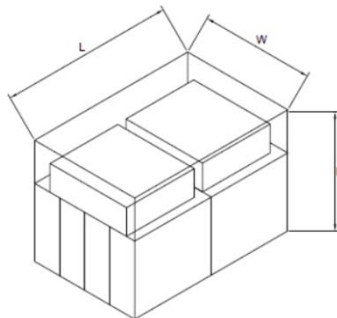


BOX EXPLANATION



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



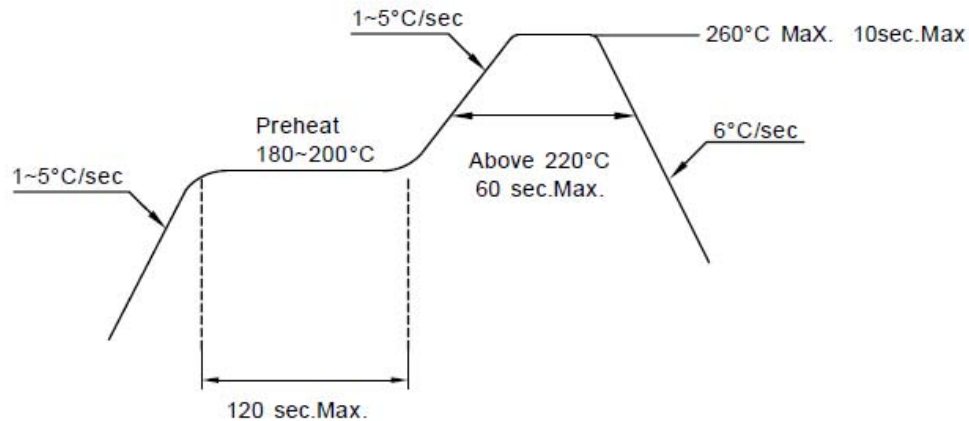
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RECOMMENDED SOLDERING CONDITION

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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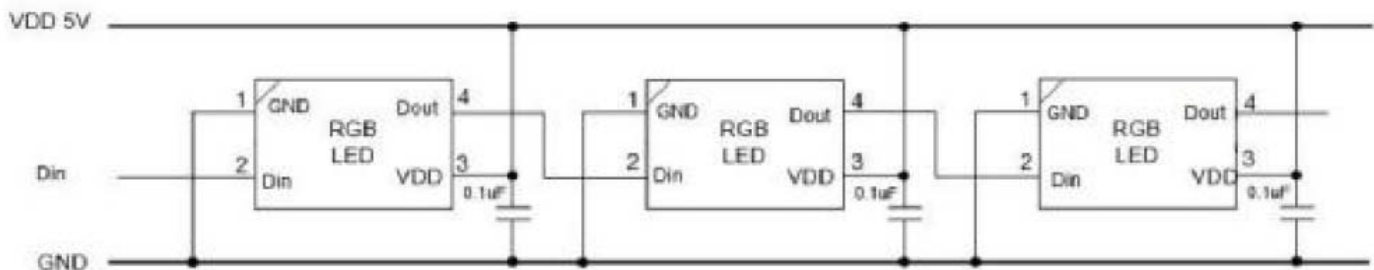
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PRECAUTION FOR USE

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.