Technical Data Sheet

Full Color Side View LEDs (Height 0.8mm)

99-235/RGBC/TR8

Features

- White package.
- Optical indicator.
- Colorless clear window.
- Ideal for backlight and light pipe application.
- Inter reflector.
- Wide viewing angle.
- Suitable for vapor-phase reflow, Infrared reflow and wave solder processes.
- Computable with automatic placement equipment.
- Available on tape and reel (12mm Tape)
- Pb-free
- The product itself will remain within RoHS compliant version.

Descriptions

- The 99-235 series is available in soft red, green and blue. Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector. This feature makes the ideal for light pipe application. The low current requirement makes this device ideal for portable equipment or any other application where power is at a premium.

Applications

- Telecommunication: indicator and backlighting in telephone and fax.
- Flat backlight for LCD's, switches and symbols.
- Light pipe application.
- General use.

Device Selection Guide

Chip			Resin Color
Type	Material	Emitted Color	
R	AlGaInP	Brilliant Red	Water Clear
G	InGaN	Brilliant Green	
B	InGaN	Blue	

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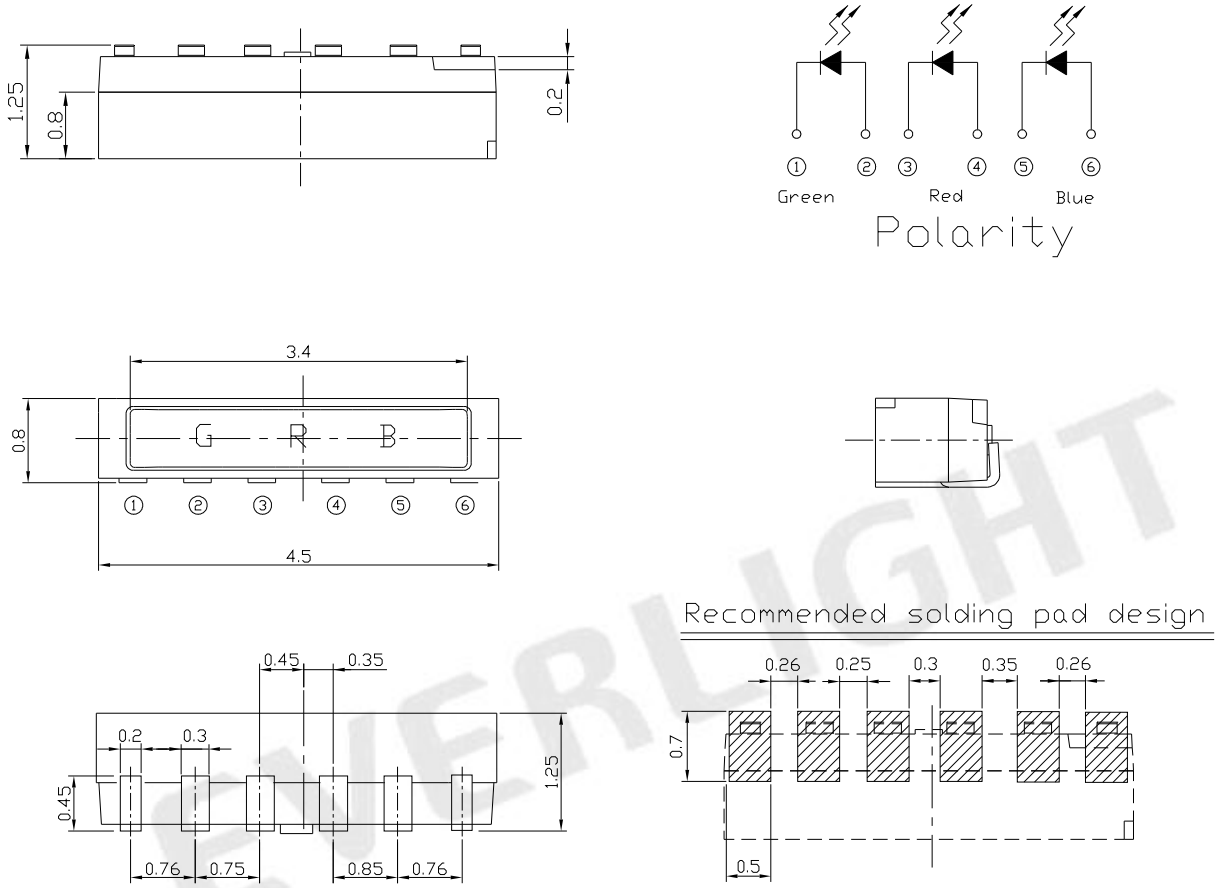
Package Outline Dimensions



Note: The tolerances unless mentioned is ±0.1mm ;Unit = mm

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Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol		Rating	Unit
Reverse Voltage	V_R		5	V
Forward Current	I_F	R	50	mA
		G	30	
		B	30	
Peak Forward Current(Duty 1/10@ 1KHZ)	I_{FP}	R	100	mA
		G	100	
		B	100	
Power Dissipation	Pd	R	120	mW
		G	110	
		B	110	
Electrostatic Discharge(HBM)	ESD	R	2000	V
		G	1000	
		B	1000	
Operating Temperature	Topr		-40 ~ +85	℃
Storage Temperature	Tstg		-40~ +90	℃
Soldering Temperature	Tsol		Reflow Soldering : 260 ℃ for 10 sec. Hand Soldering : 350 ℃ for 3 sec.	

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Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol		Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I_V	R	180	-----	1120	mcd	I_F=20mA
		G	450	-----	2850		
		B	72	-----	715		
Viewing Angle	2 θ 1/2		-----	120	-----	deg	I_F=20mA
Peak Wavelength	λ p	R	-----	632	-----	nm	I_F=20mA
		G	-----	518	-----		
		B	-----	468	-----		
Dominant Wavelength	λ d	R	605.5	-----	633.5	nm	I_F=20mA
		G	515	-----	540		
		B	449.5	-----	476.5		
Spectrum Radiation Bandwidth	△λ	R	-----	20	-----	nm	I_F=20mA
		G	-----	35	-----		
		B	-----	25	-----		
Forward Voltage	V_F	R	1.6	-----	2.6	V	I_F=20mA
		G	2.5	-----	3.8		
		B	2.5	-----	3.8		
Reverse Current	I_R	R	-----	-----	10	μA	V_R=5V
		G	-----	-----	50		
		B	-----	-----	50		

Notes:

1.Tolerance of Luminous Intensity ±11%

2.Tolerance of Dominant Wavelength ±1nm

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Bin Range of Luminous Intensity (R)

Bin Code	Min.	Max.	Unit	Condition
S	180	285	mcd	IF=20mA
T	285	450		
U	450	715		
V	715	1120		

Bin Range of Luminous Intensity (G)

Bin Code	Min.	Max.	Unit	Condition
U	450	715	mcd	IF=20mA
V	715	1120		
W	1120	1800		
S	1800	2850		

Bin Range of Luminous Intensity (B)

Bin Code	Min.	Max.	Unit	Condition
Q	72	112	mcd	IF=20mA
R	112	180		
S	180	285		
T	285	450		
U	450	715		

Notes: Tolerance of Luminous Intensity ±11%

Technical Data Sheet

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Bin Range of Dominant Wavelength

Chip	Bin	Min	Max	Unit	Condition
R	E1	605.5	609.5	nm	I_F=20mA
	E2	609.5	613.5		
	E3	613.5	617.5		
	E4	617.5	621.5		
	E5	621.5	625.5		
	E6	625.5	629.5		
	E7	629.5	633.5		
G	W	515	520		
	X	520	525		
	Y	525	530		
	Z	530	535		
	V	535	540		
B	A4	449.5	452.5		
	A5	452.5	455.5		
	A6	455.5	458.5		
	A7	458.5	461.5		
	A8	461.5	464.5		
	A9	464.5	467.5		
	A10	467.5	470.5		
	A11	470.5	473.5		
	A12	473.5	476.5		

Note: Tolerance of Dominant Wavelength: ±1nm

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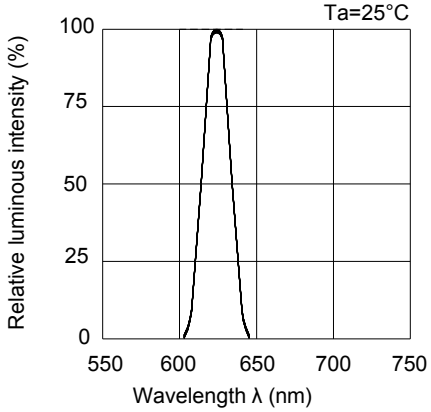
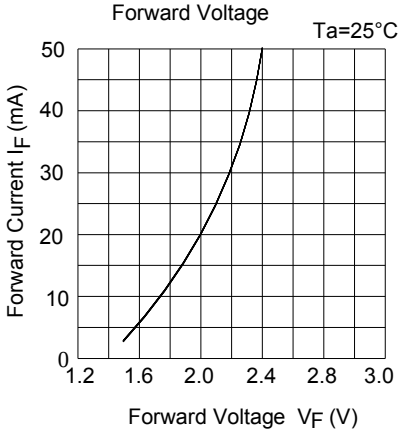
Typical Electro-Optical Characteristics Curves(R)

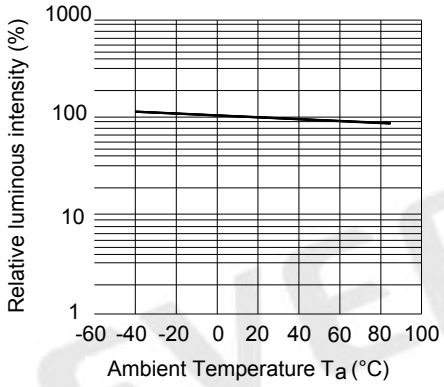
Spectrum Distribution



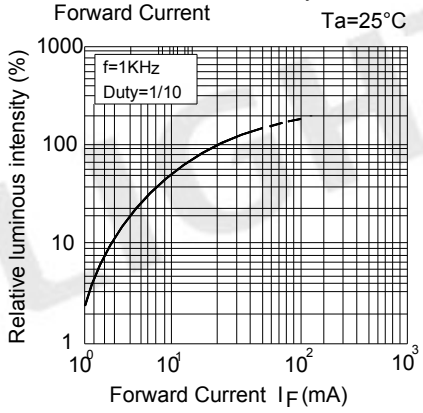
Forward Current vs. Forward Voltage



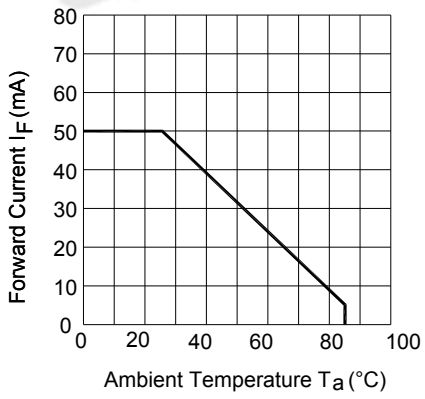
Relative Luminous Intensity vs. Ambient Temperature



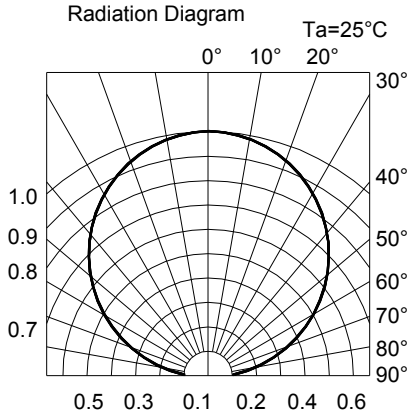
Relative Luminous Intensity vs. Forward Current



Forward Current Derating Curve



Radiation Diagram



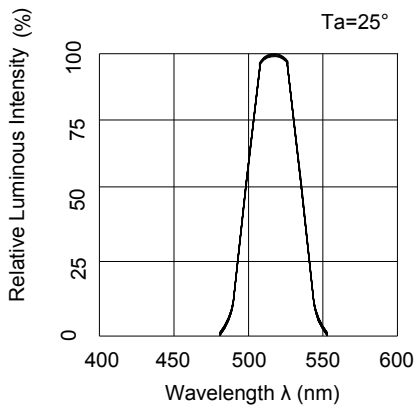
Technical Data Sheet

Full Color Side View LEDs (Height 0.8mm)

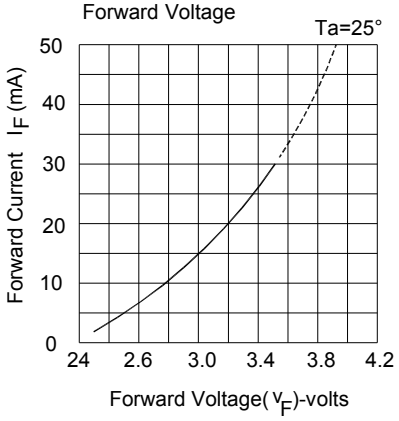
99-235/RGBC/TR8

Typical Electro-Optical Characteristics Curves(G)

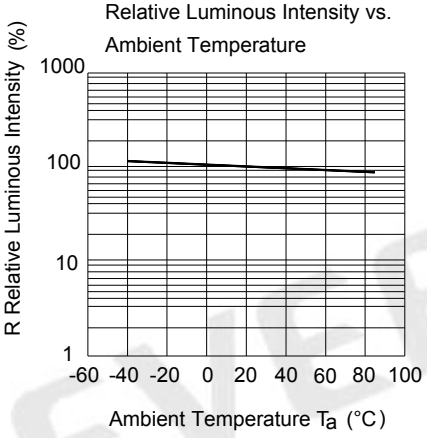
Spectrum Distribution



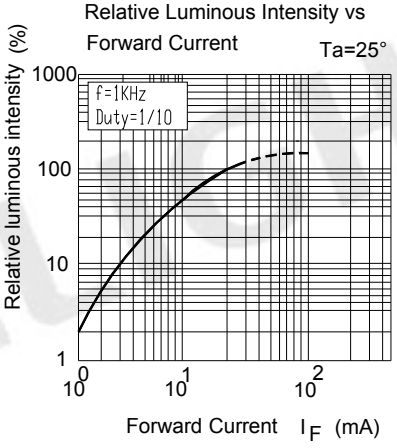
Forward Voltage



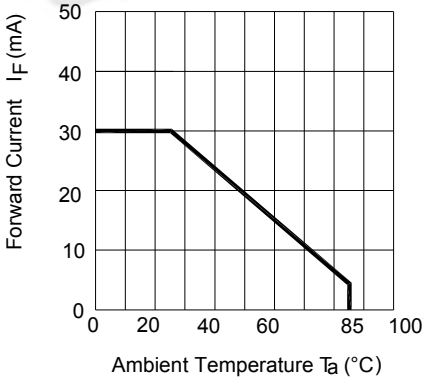
Relative Luminous Intensity vs. Ambient Temperature



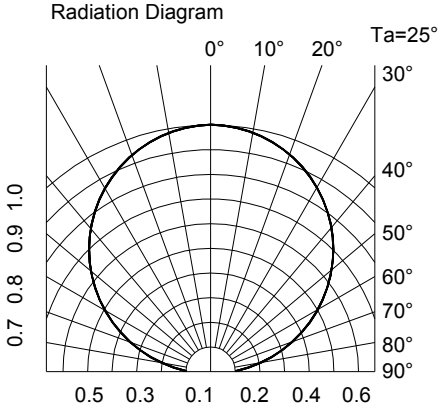
Relative Luminous Intensity vs Forward Current



Forward Current Derating Curve



Radiation Diagram



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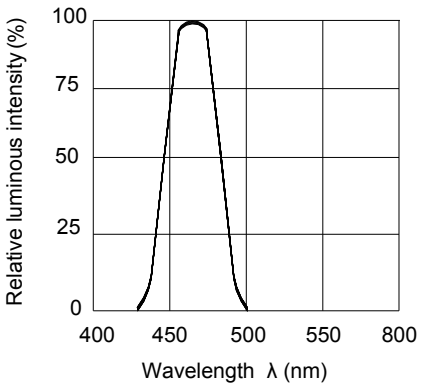
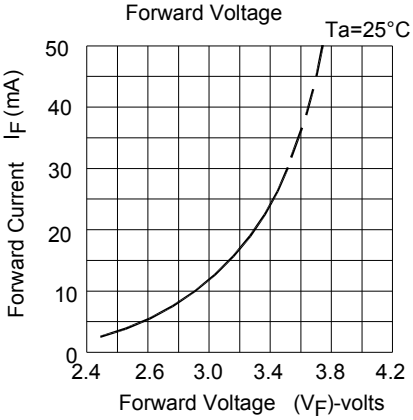
Typical Electro-Optical Characteristics Curves(B)

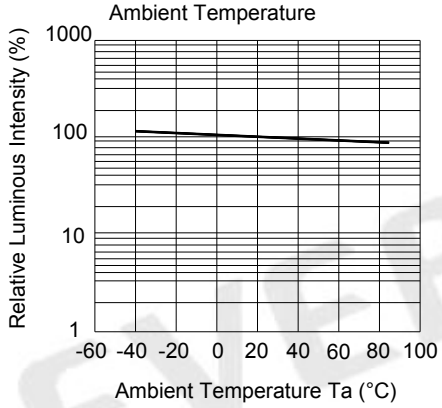
Spectrum Distribution



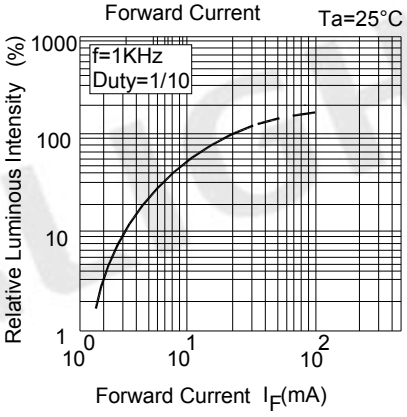
Forward Current vs. Forward Voltage



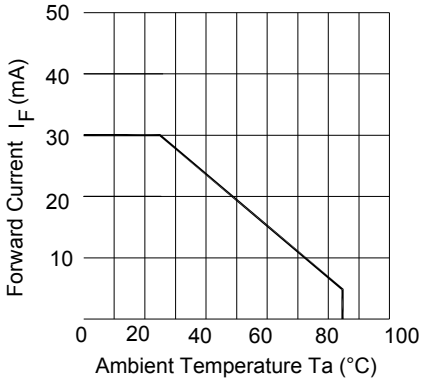
Relative Luminous Intensity vs. Ambient Temperature



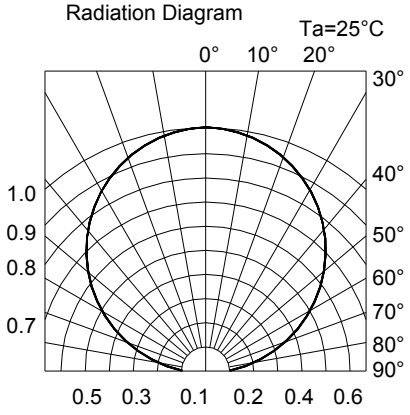
Rel. Luminous Intensity vs Forward Current



Forward Current Derating Curve



Radiation Diagram



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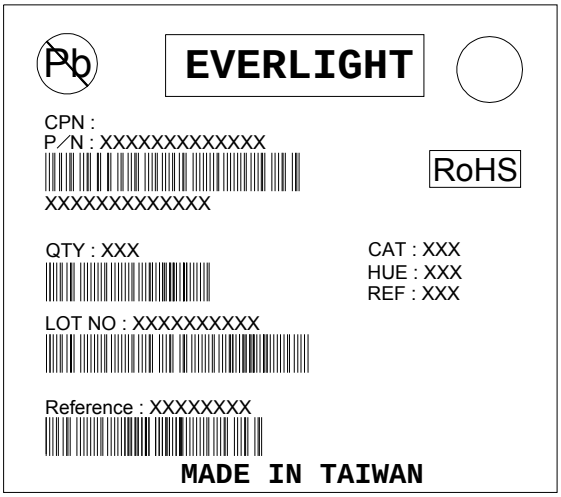
Label Explanation

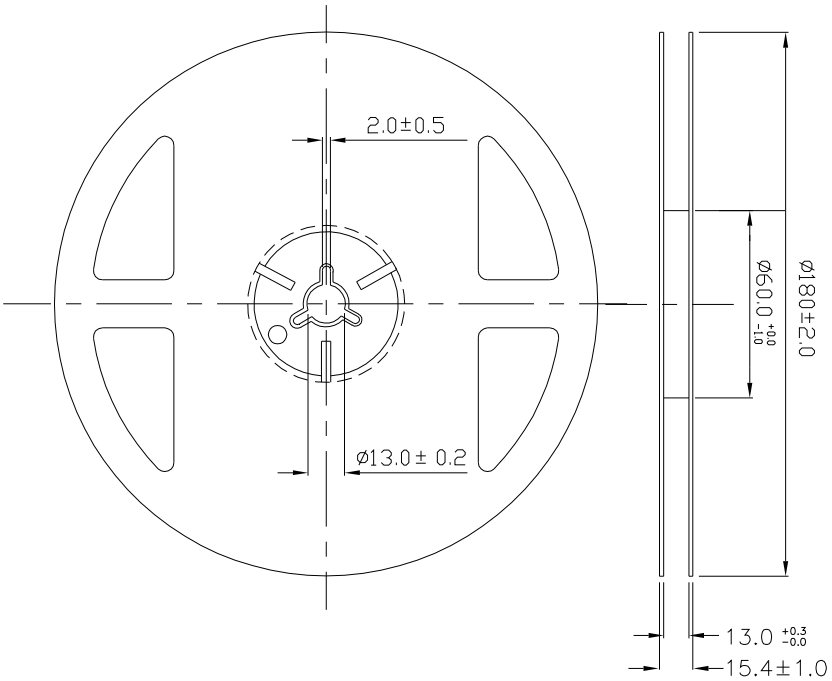
CAT: Luminous Intensity Rank

HUE: Dom. Wavelength Rank

REF: Forward Voltage Rank



Reel Dimensions



Note: Tolerances Unless Dimension ±0.1mm, Unit = mm

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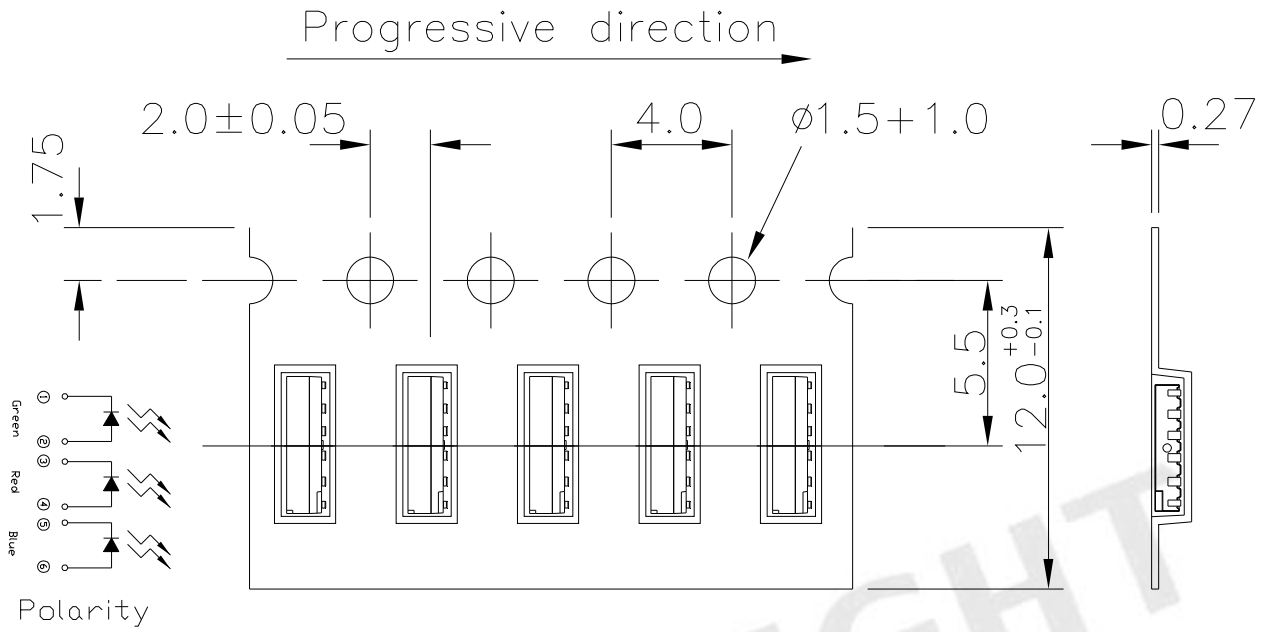
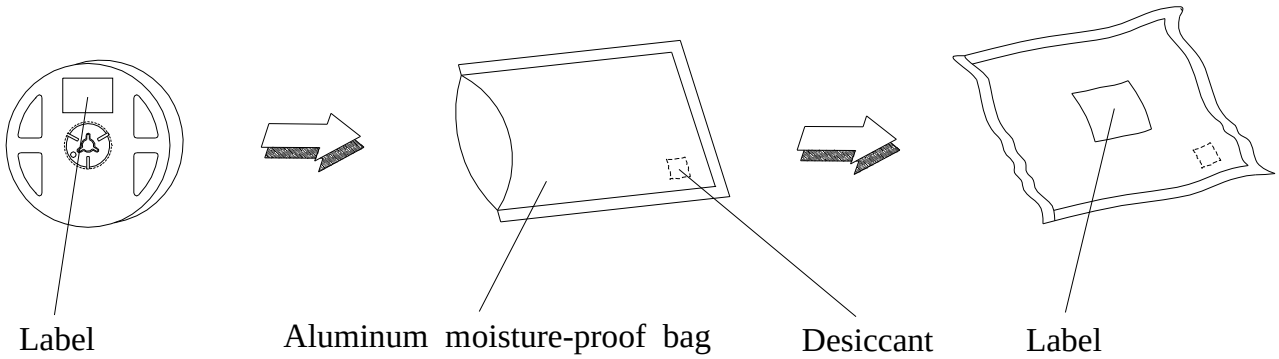
Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel.



Note: Tolerances Unless Dimension ±0.1mm, Unit = mm

Moisture Resistant Packaging



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Reliability Test Items and Conditions

The reliability of products shall be satisfied with items listed below.
Confidence level：90%
LTPD：10%

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Reflow Soldering	Temp. : 260℃±5℃ Max. 10 sec.	6 min	22 PCS.	0/1
2	Temperature Cycle	H : +100℃ 15min ∫ 5 min L : -40℃ 15min	300 Cycles	22 PCS.	0/1
3	Thermal Shock	H : +100℃ 5min ∫ 10 sec L : -10℃ 5min	300 Cycles	22 PCS.	0/1
4	High Temperature Storage	Temp. : 100℃	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Temp. : -40℃	1000 Hrs.	22 PCS.	0/1
6	DC Operating Life	I_F = 20 mA	1000 Hrs.	22 PCS.	0/1
7	High Temperature / High Humidity	85℃/RH85%	1000 Hrs.	22 PCS.	0/1

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Precautions for Use

1. Over-current-proof

   Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

   2.1 Do not open moisture proof bag before the products are ready to use.

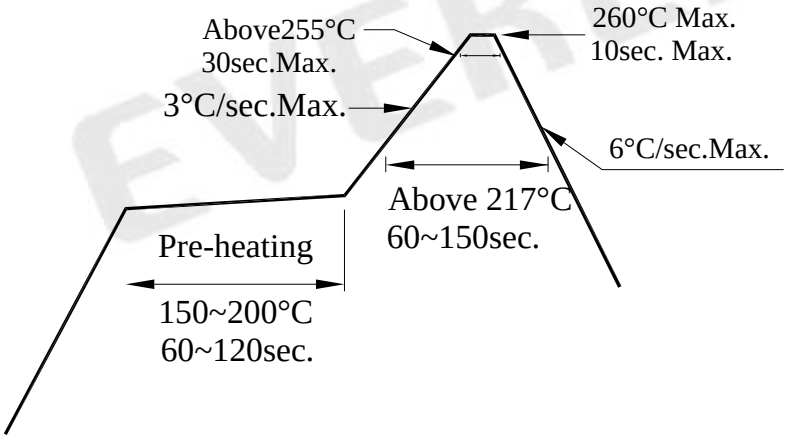
   2.2 Before opening the package: The LEDs should be kept at 30℃ or less and 90%RH or less.

   2.3 After opening the package: The LED's floor life are 4 weeks under 30℃ or less and 60% RH or less.If unused LEDs remain, it should be stored in moisture proof packages.

   2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.
   Baking treatment : 60±5℃ for 24 hours.

3. Soldering Condition

   3.1 Pb-free solder temperature profile



   3.2 Reflow soldering should not be done more than two times.

   3.3 When soldering, do not put stress on the LEDs during heating.

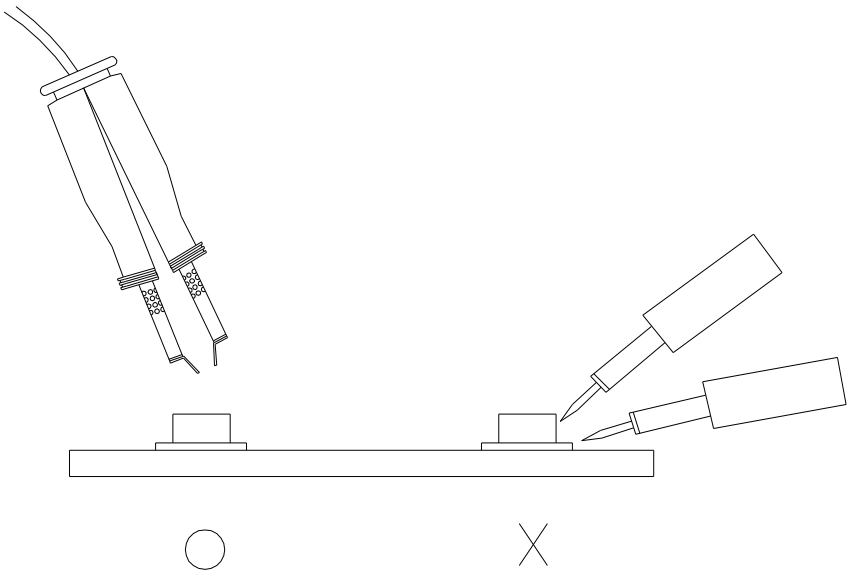
   3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350℃ for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



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