

Technical Data Sheet

Full Color Side View LEDs (Height 0.8mm)

99-235/RSGHB7C-A07/2D

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

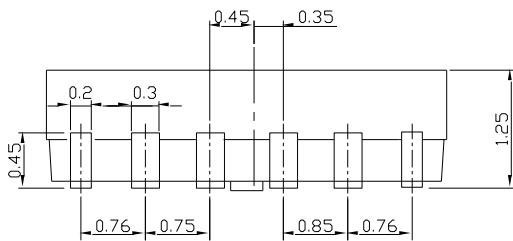
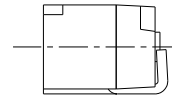
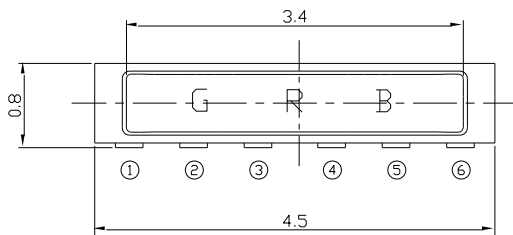
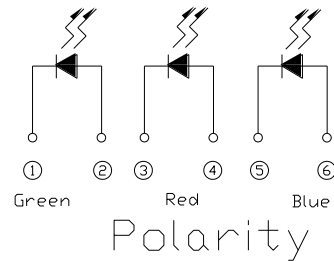
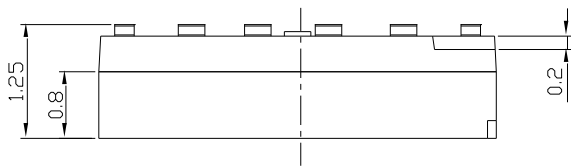
Chip			Resin Color
Type	Material	Emitted Color	
RS	AlGaInP	Brilliant Red	Water Clear
GH	InGaN	Brilliant Green	
B7	InGaN	Blue	

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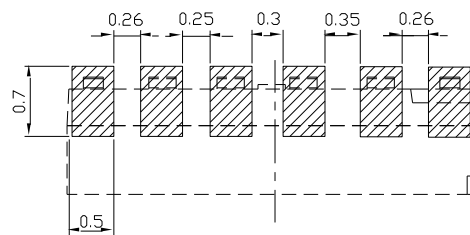
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Package Outline Dimensions



Recommended soldering pad design



Note: The tolerances unless mentioned is $\pm 0.1\text{mm}$;Unit = mm

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Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol		Rating	Unit
Reverse Voltage	V _R		5	V
Forward Current	I _F	RS	50	mA
		GH	30	
		B7	30	
Peak Forward Current(Duty 1/10@ 1KHZ)	I _{FP}	RS	100	mA
		GH	100	
		B7	100	
Power Dissipation	P _d	RS	130	mW
		GH	110	
		B7	110	
Electrostatic Discharge(HBM)	ESD	RS	2000	V
		GH	1000	
		B7	1000	
Operating Temperature	T _{opr}		-40 ~ +85	°C
Storage Temperature	T _{stg}		-40~ +90	°C
Soldering Temperature	T _{sol}		Reflow Soldering : 260 °C for 10 sec. Hand Soldering : 350 °C for 3 sec.	

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Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition	
Luminous Intensity	Iv	RS	200	-----	800	mcd	If=20mA
		GH	500	-----	1300		
		B7	100	-----	550		
Viewing Angle	$2\theta_{1/2}$	-----	120	-----	deg	If=20mA	
Peak Wavelength	λ_p	RS	-----	632	-----	nm	If=20mA
		GH	-----	518	-----		
		B7	-----	468	-----		
Dominant Wavelength	λ_d	RS	619	-----	629	nm	If=20mA
		GH	525	-----	535		
		B7	455	-----	465		
Spectrum Radiation Bandwidth	$\Delta\lambda$	RS	-----	20	-----	nm	If=20mA
		GH	-----	36	-----		
		B7	-----	26	-----		
Forward Voltage	VF	RS	-----	2.0	2.4	V	If=20mA
		GH	-----	3.3	3.7		
		B7	-----	3.3	3.7		
Reverse Current	IR	RS	-----	-----	10	μA	VR=5V
		GH	-----	-----	50		
		B7	-----	-----	50		

Notes:

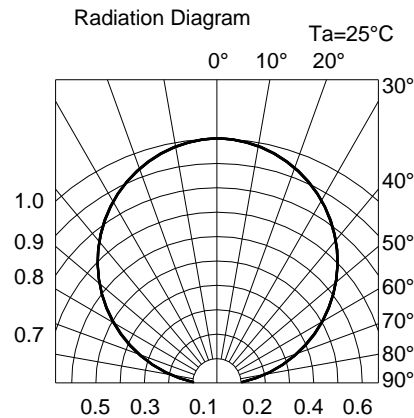
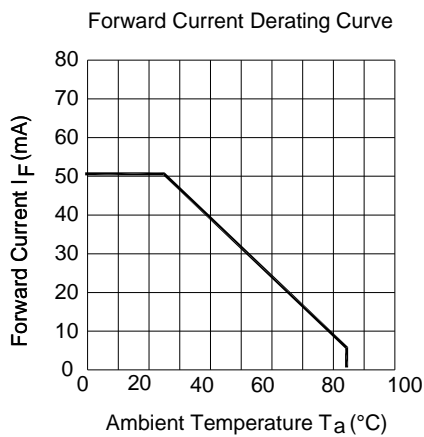
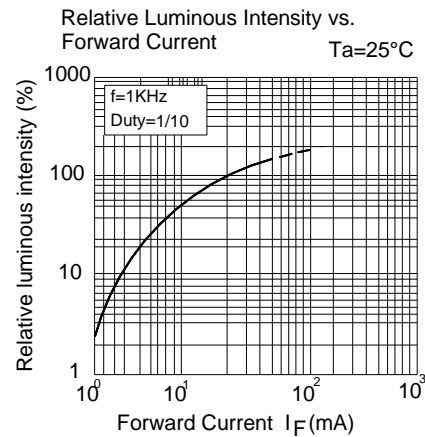
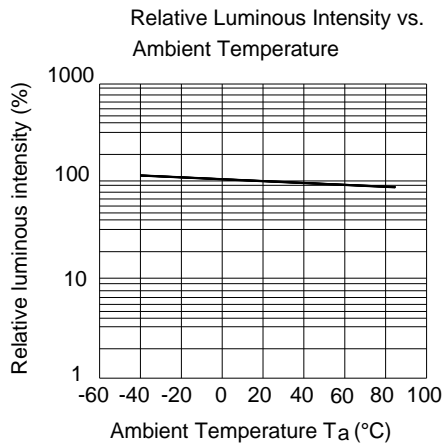
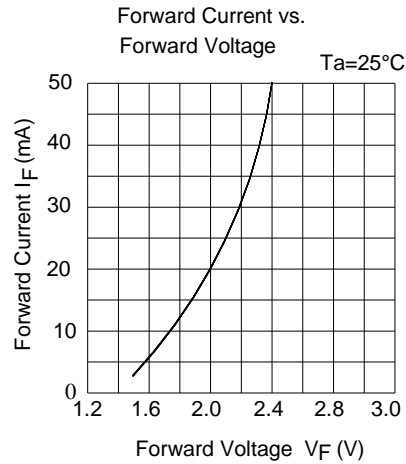
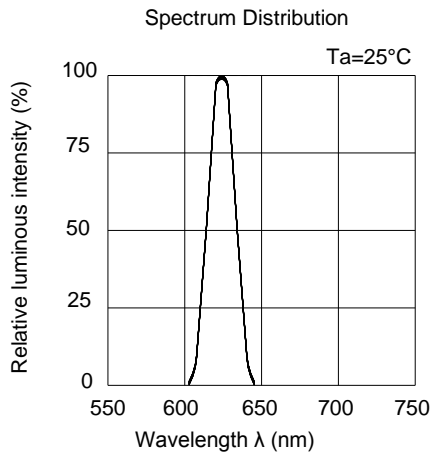
- 1.Tolerance of Luminous Intensity $\pm 11\%$
- 2.Tolerance of Dominant Wavelength $\pm 1\text{nm}$

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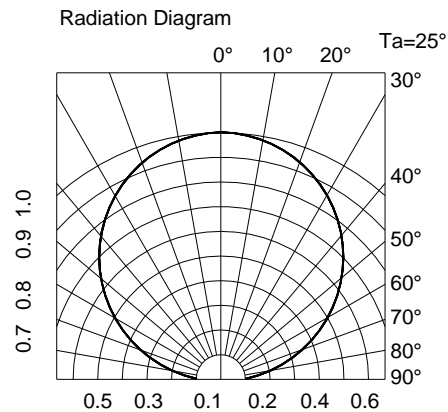
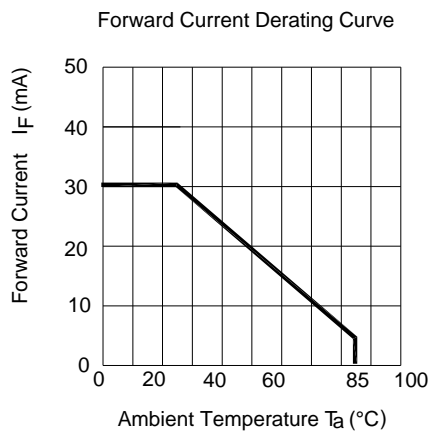
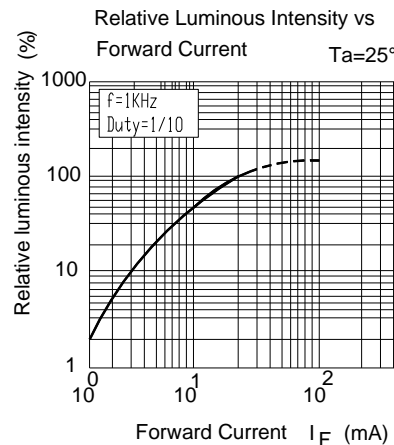
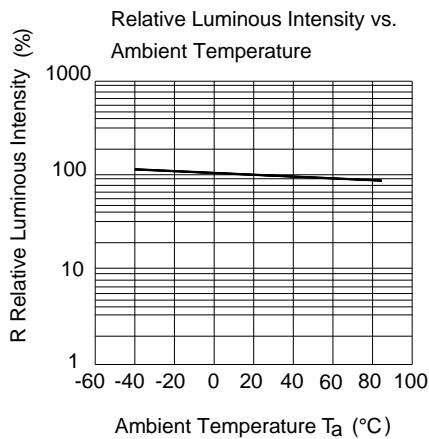
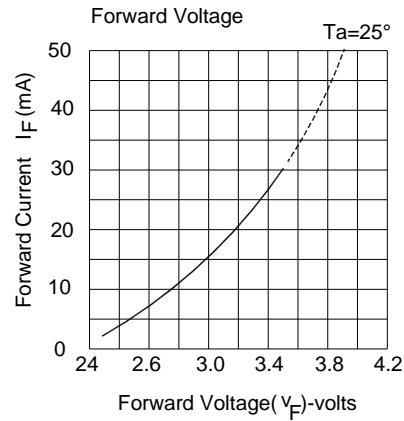
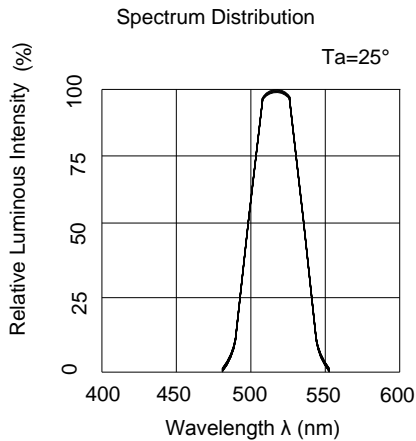
Typical Electro-Optical Characteristics Curves(RS)



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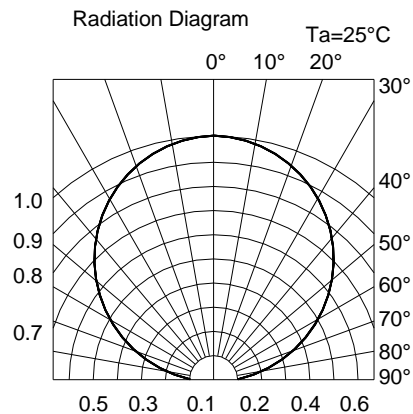
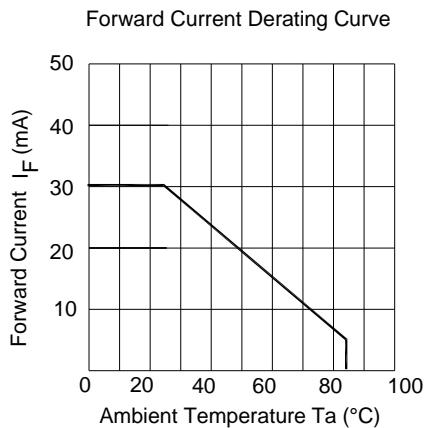
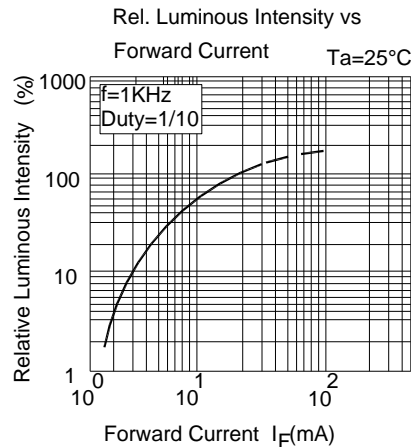
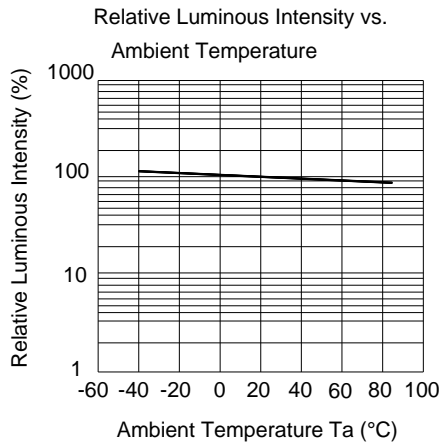
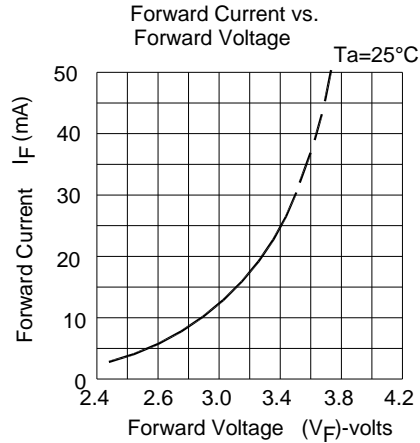
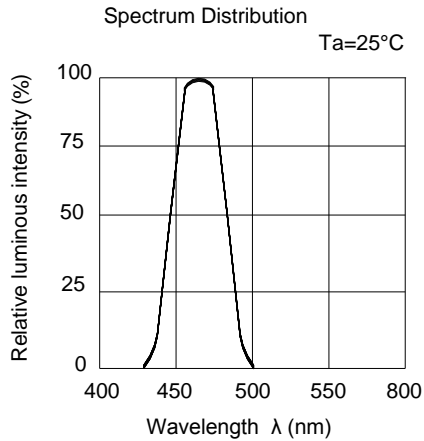
Typical Electro-Optical Characteristics Curves(GH)



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Typical Electro-Optical Characteristics Curves(B7)



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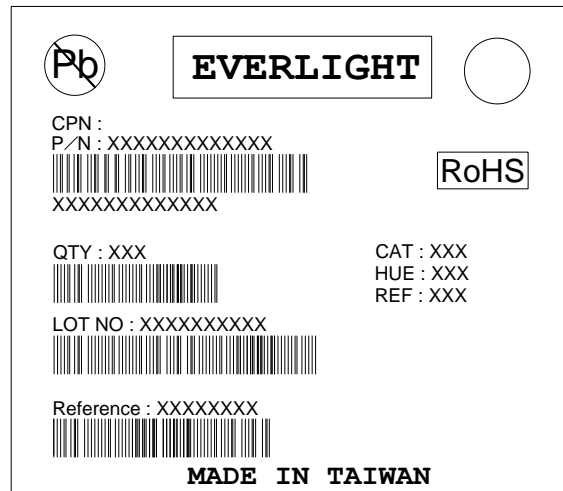
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Label Explanation

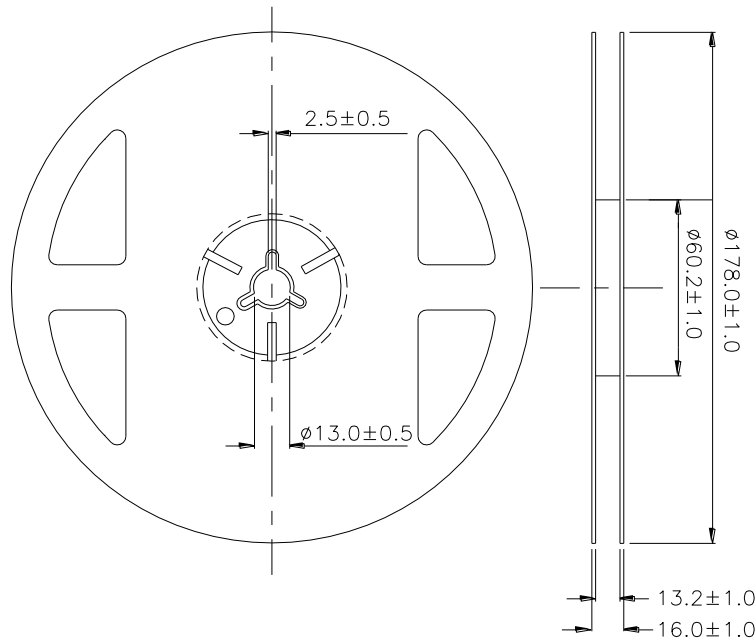
CAT: Luminous Intensity Rank

HUE: Dom. Wavelength Rank

REF: Forward Voltage Rank



Reel Dimensions

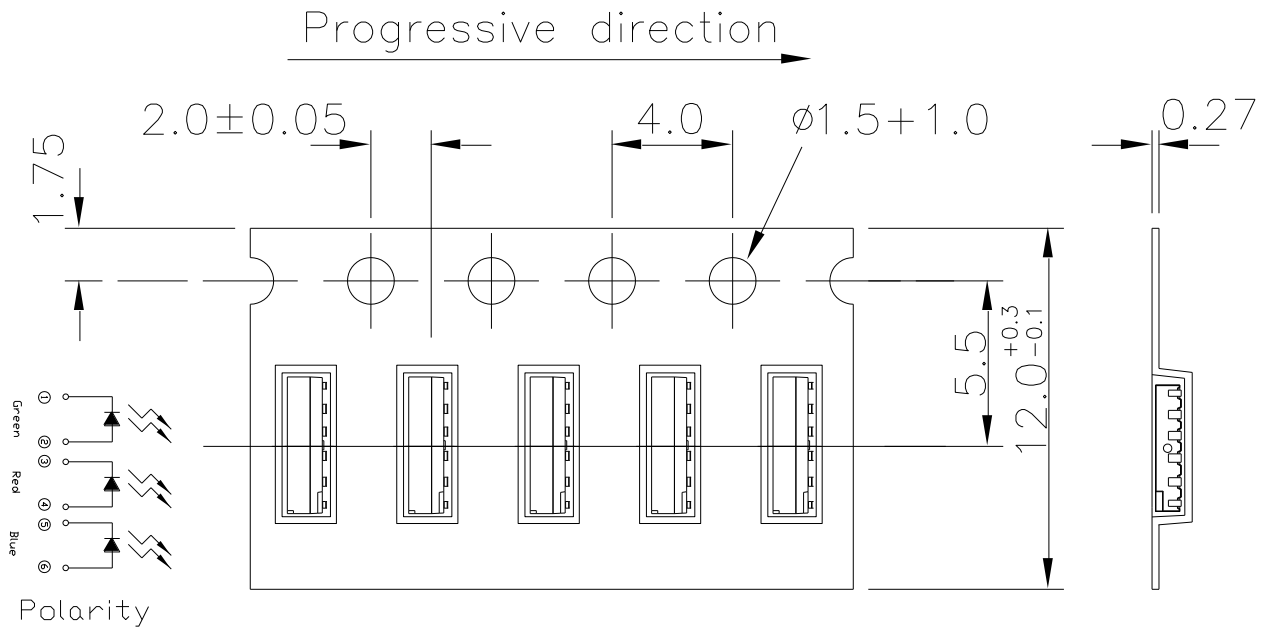


Note: Tolerances Unless Dimension ± 0.1 mm, Unit = mm

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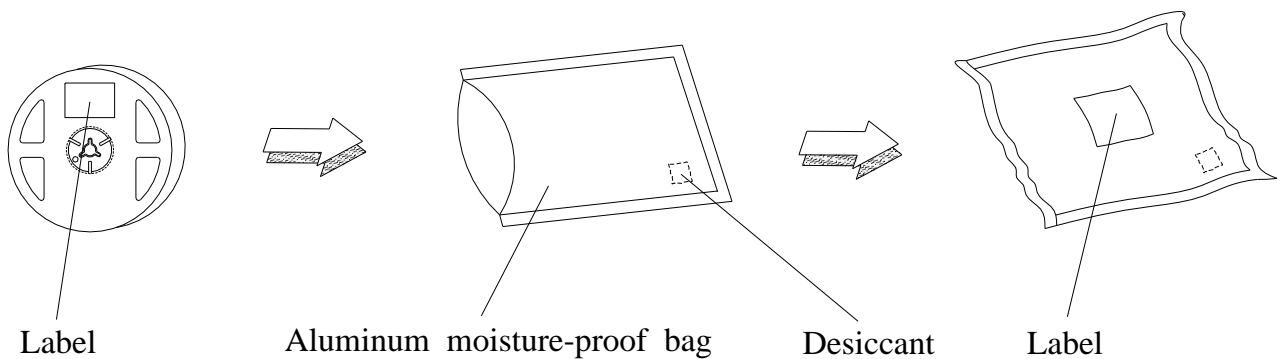
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Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel.



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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°C±5°C Max. 10sec.	6 min	22 PCS.	0/1
2	Temperature Cycle	H : +100°C 15min ∫ 5 min L : -40°C 15min	300 Cycles	22 PCS.	0/1
3	Thermal Shock	H : +100°C 5min ∫ 10 sec L : -10°C 5min	300 Cycles	22 PCS.	0/1
4	High Temperature Storage	Temp. : 100°C	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Temp. : -40°C	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°C/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°C or less and 90%RH or less.

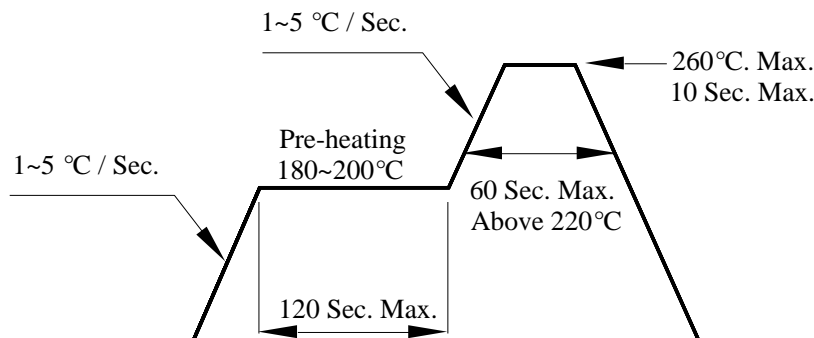
2.3 After opening the package: The LED's floor life are 168 hours under 30°C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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°C 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°C 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.

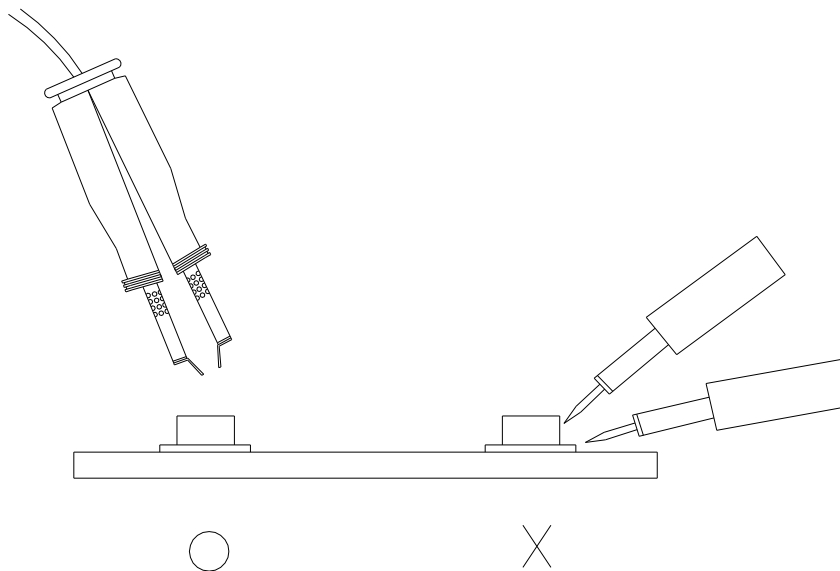
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5. Repairing

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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