DATASHEET

SMD ▪ B
19-C47/RSGHBHC-5V01/2T



Features
- Package in 8mm tape on 7″ diameter reel.
- Compatible with automatic placement equipment.
- Compatible with infrared and vapor phase reflow solder process.
- Full-color type.
- 8 bit PWM control with 256 grayscales for each RGB chip.
- Pb-free
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH.
- Compliance Halogen Free .(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)

Description
- The 19-C47 SMD LED is much smaller than lead frame type components, thus enable smaller board size, higher packing density, reduced storage space and finally smaller equipment to be obtained.
- Besides, lightweight makes them ideal for miniature applications. etc.
- The 19-C47 with a 3-channels LED driver with 8 bit PWM linear control.

Applications
- Indoor/Outdoor LED video display.
- Full color LED light strip.
- LED decorative lighting.
- Backlighting in dashboard and switch.
- Telecommunication: indicator and backlighting in telephone and fax.
- Flat backlight for LCD, switch and symbol.
- General use.

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Device Selection Guide

Code	Chip Materials	Emitted Color	Resin Color
RS	AlGaInP	Brilliant Red	Water Clear
GH	InGaN	Brilliant Green	
BH	InGaN	Blue	

Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Supply Voltage	V_{DD}	+4.2~+5.5	V
Input Voltage	V_{IN}	-0.5~V_{DD}+0.5	V
Electrostatic Discharge(HBM)	ESD	2000	V
Clock frequency	CLK	800	kbps
Operating Temperature	T_{opr}	-20 ~ +70	℃
Storage Temperature	Tstg	-40 ~ +90	℃
Soldering Temperature	Tsol	Reflow Soldering : 260 ℃ for 10 sec. Hand Soldering : 350 ℃ for 3 sec.	

Recommended Operating Condition (Ta=-20~70℃，V_{SS}=0V)

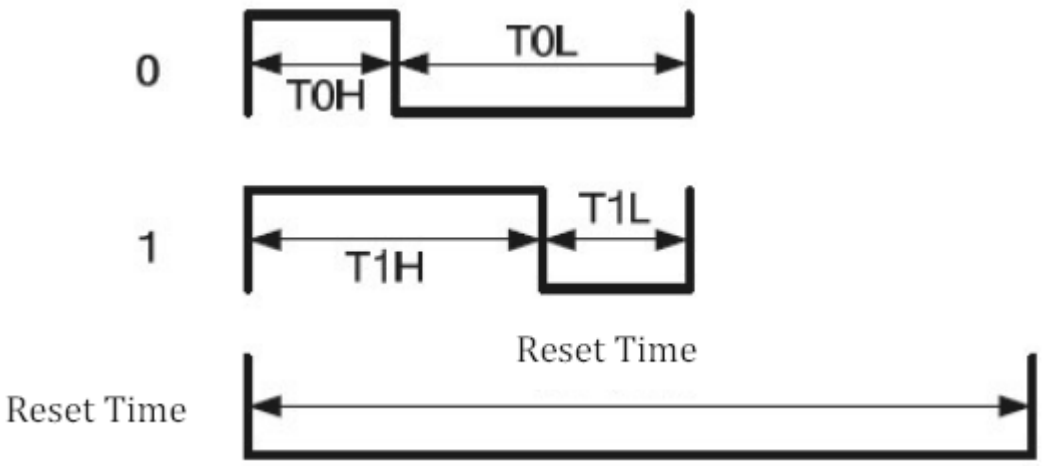
Parameter	Symbol	Condition	Min	Typ.	Max.	Unit
Supply Voltage	V_{DD}	-----	-----	5.0	-----	V
Input Voltage(High)	V_{iH}	-----	3.3	-----	V_{DD}	V
Input Voltage(Low)	V_{IL}	-----	0	-----	0.3V_{DD}	V

DC Electrical Characteristics（Ta = 25℃，VDD = 5V，Vss = 0V）

Characteristics	Symbol	Condition	Min	Typ.	Max.	Unit
Input Voltage(High)	V_{iH}	-----	3.3	-----	-----	V
Input Voltage(Low)	V_{IL}	-----	-----	-----	0.3V_{DD}	V
Current Dissipation	IDD	$OUT_{R/G/B}$ [7:0]= 8b'00000000 @ Latch time=2ms	-----	2.5	-----	

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Timing Wave Form

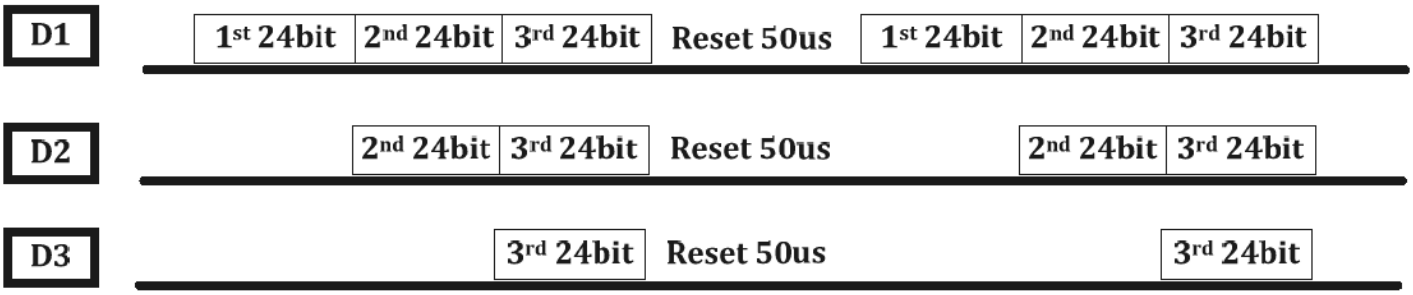


High Speed mode

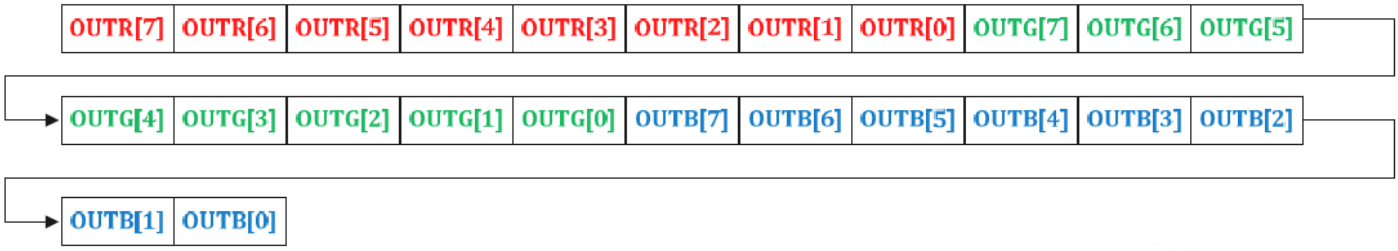
Item	Description	Typical	Allowance
T_{0H}	0 code ‧ High-level time	300ns	±80ns
T_{0L}	0 code ‧ Low-level time	900ns	±80ns
T_{1H}	1 code ‧ High-level time	900ns	±80ns
T_{1L}	1 code ‧ Low-level time	300ns	±80ns
RES	Reset time	>50us	

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Data Communication



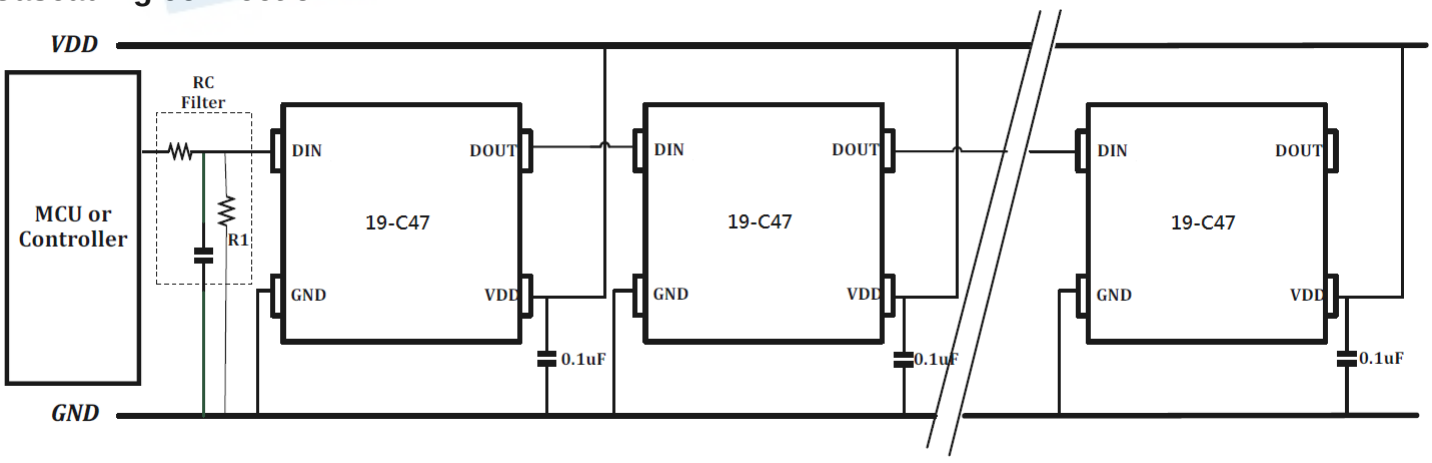
Single Data in 24bit for RGB



Time Interval between 24 bits signal



Cascading connection



Note1: RC Filter and R1 must be added or reserved on the board for better waveform of signals in different applications.
The suggested value of R1 is 10K ~100K . The value is subject to the practical system environment.
Note2: The by-pass capacitor of VDD pin is necessary to be added on the board for the stability of chip operation.
The suggested value of capacitor is 0.1uF.
Note3: More note of layout and control, please ask for document.

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Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Code	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	Iv	RS	28.5	70	180	mcd	I_F=5mA
		GH	140	180	360		
		BH	28.5	40	72.0		
Viewing Angle	$2\theta_{1/2}$		-----	120	-----	Deg	
Peak Wavelength	λ p	RS	-----	632	-----	nm	
		GH	-----	518	-----		
		BH	-----	468	-----		
Dominant Wavelength	λ d	RS	617.5	-----	629.5	nm	
		GH	525	-----	540		
		BH	465	-----	475		
Spectrum Radiation Bandwidth	△λ	RS	-----	20	-----	nm	
		GH	-----	35	-----		
		BH	-----	25	-----		

Note:
1. Tolerance of Luminous Intensity: ±11%
2. Tolerance of Dominant Wavelength: ±1nm

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RS
Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
N	28.5	45	mcd	I_F=5mA
P	45	72		
Q	72	112		
R	112	180		

GH
Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
R2	140	180	mcd	I_F=5mA
S1	180	225		
S2	225	285		
T1	285	360		

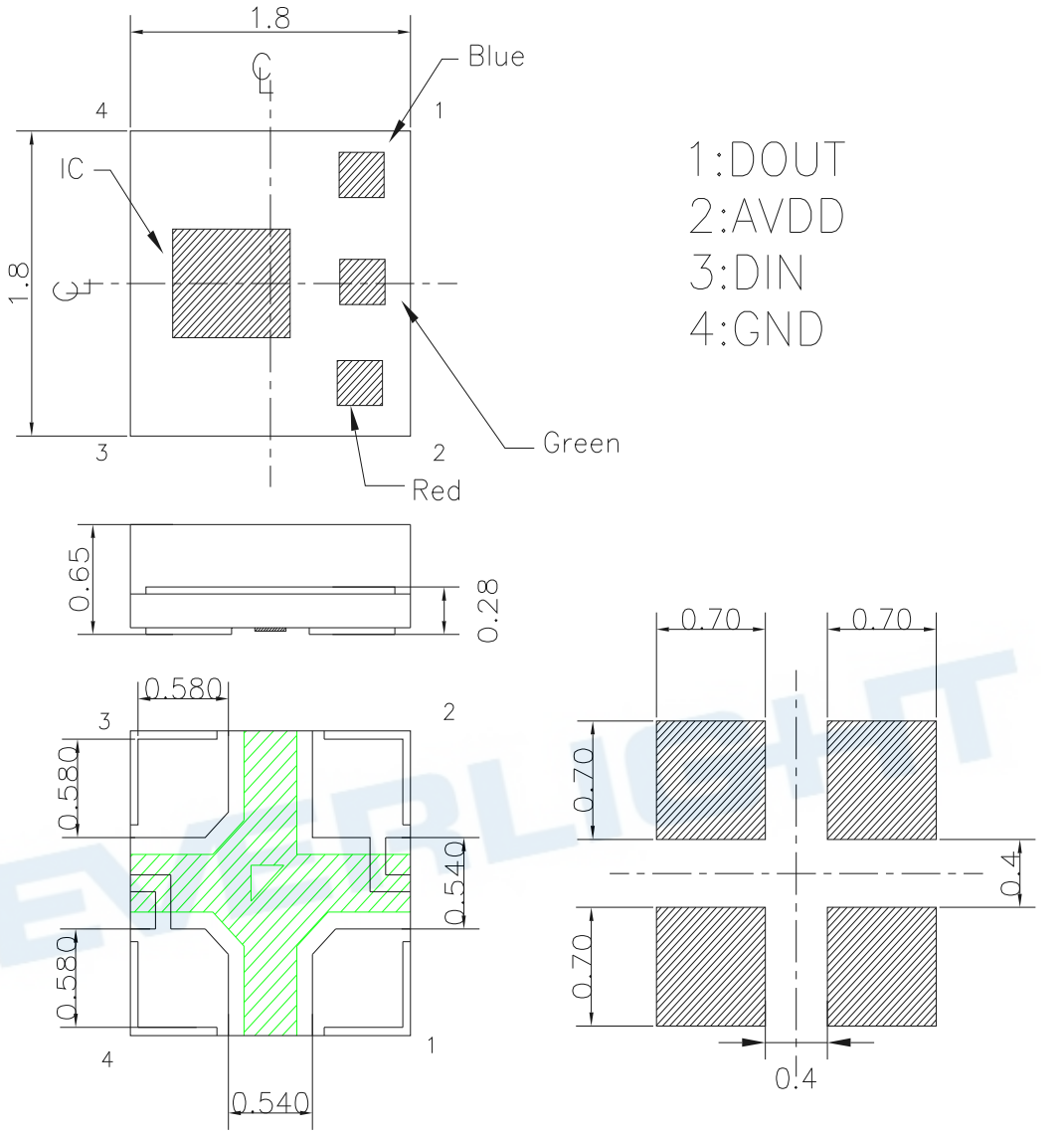
BH
Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
N	28.5	45	mcd	I_F=5mA
P	45	72		

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Package Dimension



Suggested pad dimension is just for reference only.
Please modify the pad dimension based on individual need.

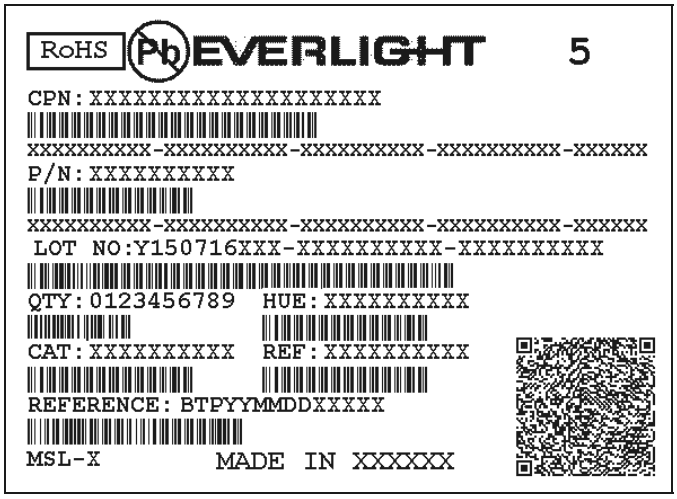
Note: Tolerances unless mentioned ±0.1mm. Unit = mm

PIN Function

NO.	Symbol	PIN	Function description
1	DOUT	DATA OUT	Control data signal output
2	VDD	POWER VOLTAGE	Power Voltage, connect to “+5V”
3	DIN	DATA IN	Control data signal input
4	GND	GROUND	Data & Power Grounding

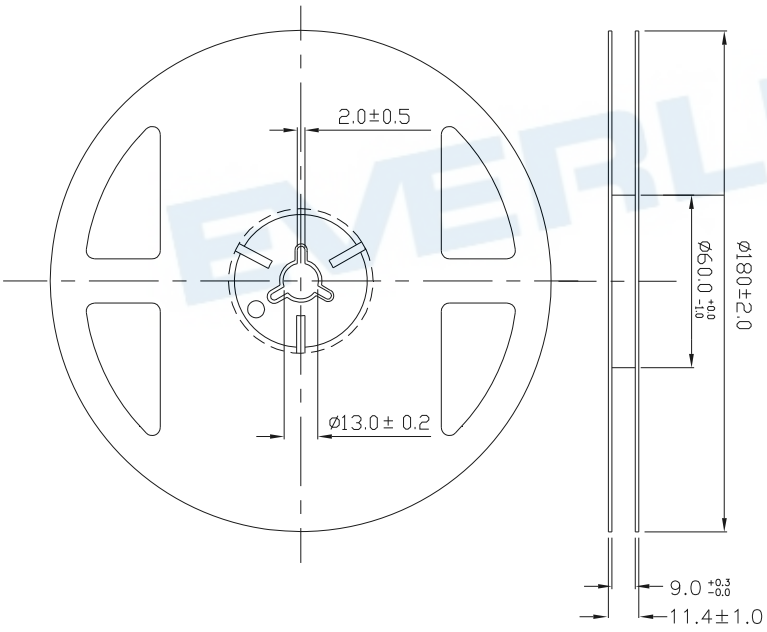
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Moisture Resistant Packing Materials
Label Explanation



- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Chromaticity Coordinates & Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

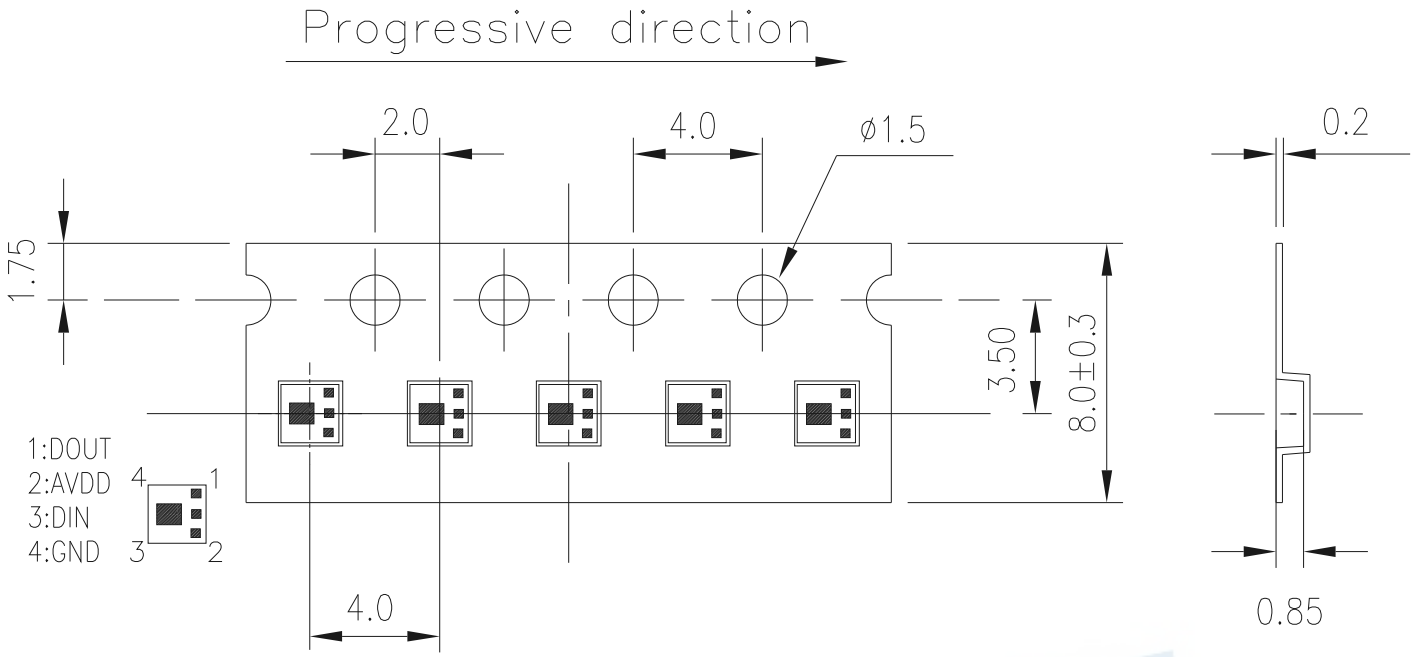
Reel Dimensions



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

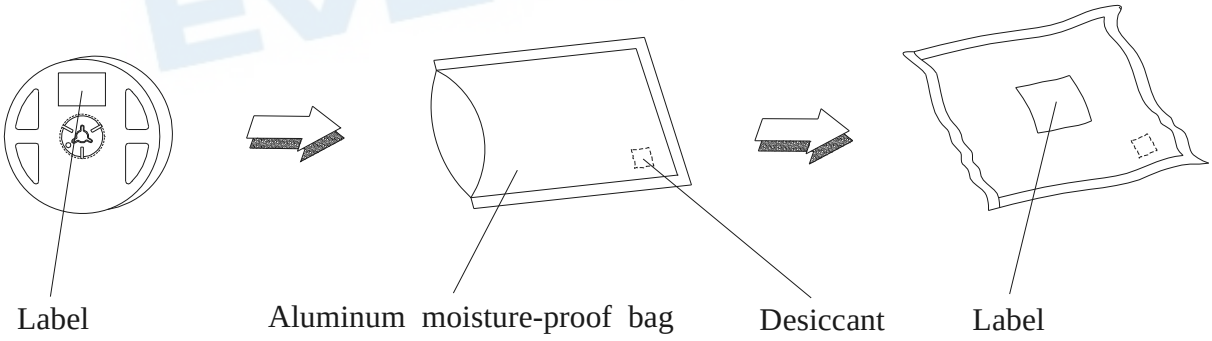
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Carrier Tape Dimensions: Loaded quantity 2000 PCS per reel



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

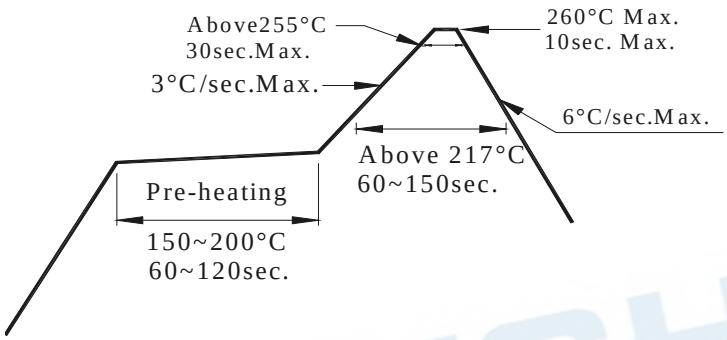
Moisture Resistant Packaging



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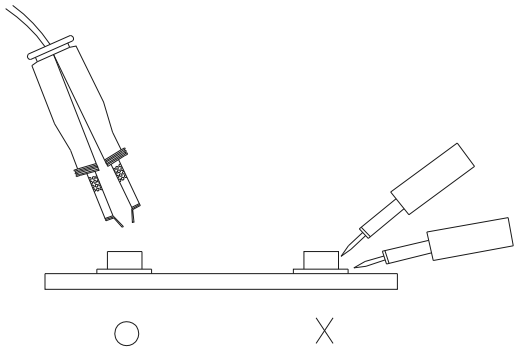
Precautions For Use

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 is 168hrs 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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High reliability applications such as military/aerospace, automotive safety/security systems, and medical equipment may require different product. If you have any concerns, please contact Everlight before using this product in your application. This specification guarantees the quality and performance of the product as an individual component. Do not use this product beyond the specification described in this document.

DISCLAIMER

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2. The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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