DATASHEET

SMD ▪ B
B1818IC/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.
- Support signal reshaping to pass control waveforms to next adjacent driver
- Cascading port transmission by dual-wire (clock and data) lines
- Built-in current regulator, three-way drive.
- 256-step gray-scale output to allow 16,777,216 color display.
- Support 8192-level GAMMA 2.8 resolution
- 13-bit PWM for each of RGB outputs
- 32-step dimming control.
- Maximum serial input data/clock frequency 15MHz.
- 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 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.

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.
- General use.

Device Selection Guide

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

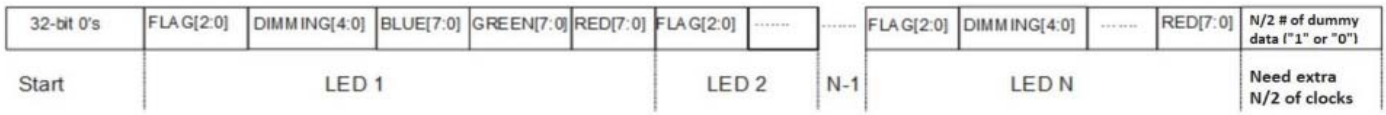
Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Code	Rating	Unit
LED Forward Current (Per Chip)	I_{OUT}		20	mA
Supply Voltage	V_{DD}		6.5	V
Power Dissipation	P_D		<400	mW
Operating Temperature	T_{opr}		-25 ~ +85	℃
Storage Temperature	Tstg		-40 ~ +90	℃
Soldering Temperature	Tsol		Reflow Soldering : 260 ℃ for 10 sec. Hand Soldering : 350 ℃ for 3 sec.	

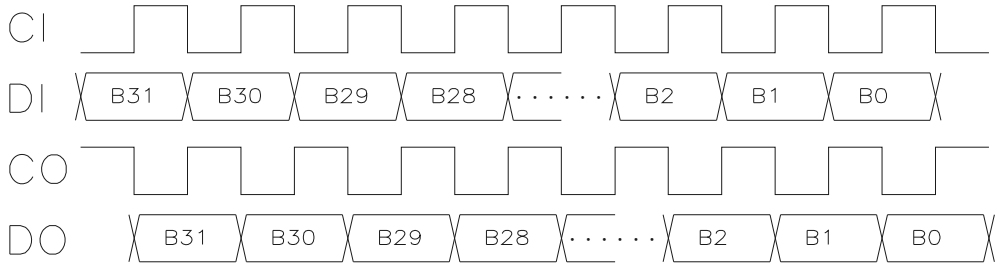
Electrical Characteristics (Ta=25℃，VDD=5.0V)

Characteristic	Symbol	Condition	Min	Typ.	Max.	Unit
Supply Voltage	V_{DD}	-----	4.5	5.0	5.5	V
Output Current (Pre Chip)	I_{OL}		-----	20	-----	mA
Operation current	I_{dyn}	VDD=5V RGB off			1.2	mA
Logic input control DI/CI						
Input Voltage(High)	V_{iH}	-----	2.7	-----	VDD+0.4	V
Input Voltage(Low)	V_{IL}	-----	-0.4	-----	1.0	V
Pull-up resistance (CI、DI)	R_{IN}			80K		Ω
CI Frequency	C_{FREQ}				15	MHz
CI High pulse width	T_{CKH}		30			ns
CI Low pulse width	T_{CKL}		30			ns
DI to CI Rise setup	T_{SETUP}		10			ns
DI to CI Rise hold	T_{HOLD}		5			ns
Logic output DO/CO						
Output High “H”	V_{OH}	4mA@VDD=5V	4.5	-----	-----	V
Output High “L”	V_{OL}	4mA@VDD=5V	-----	-----	0.4	V

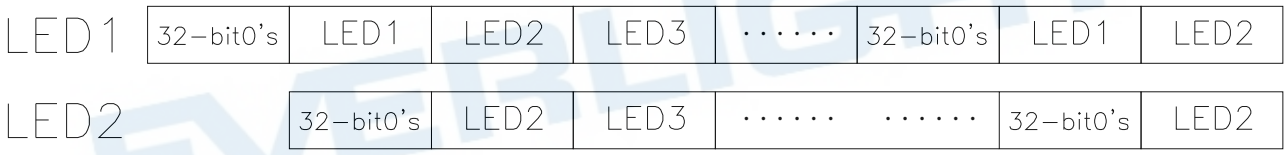
Command Set



32 consecutive 0's denote the start of a command for B1818IC LED. After receiving 32 0's, B1818IC gets the following 32 bits as the received command, including FLAG, DIMMING, BLUE, GREEN and RED fields.

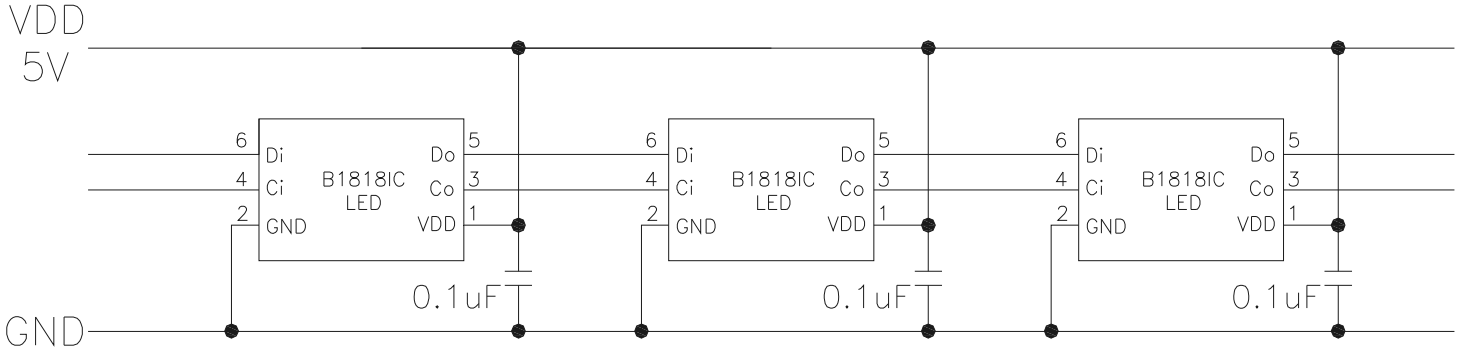


The serial command is transmitted with MSB first, DI is latched at the rising edge of CI clock. CO and DO are re-generated for the next B1818IC LED. CO is inverted from CI. When 32 consecutive 0's are encountered, the next 1 is expected to start a 32-bit command, i.e., FLAG[2:0]=1xx. When FLAG[2:0]=1xx, then DIMMING,BLUE, GREEN and RED fields are latched respectively.
while the current 32-bit command is got,B1818IC passes remaining command bits to the next B1818IC After the last one command is issued for the last LED (LED n), the following 32 consecutive 1's denote the end of the current command for B1818IC LED(End of Frame) and wait for next 32 consecutive 0's to start a new command set.(Note:B1818IC is workable either with or without "End of Frame" command, **but MCU should issue the extra N/2 numbers of clocks signal if there are N LEDs totally connected in the strip to make sure the data transfer and display of the last one LED is complete and correct**)



FLAG [2:0]：1xx to start a 32-bit command
DIMMING [4:0] ：32-level current control for R/G/B drivers
BLUE [7:0] ：256 gray levels for blue LED
GREEN [7:0] ：256 gray levels for green LED
RED [7:0]：256 gray levels for red LED

Typical Circuit of B1818IC LED strip application



When B1818IC is set to operate on 5V power system, a 0.1uF capacitor is recommended to add between power supply and ground terminal. The capacitor is suggested to put as closer as possible to IC position.

Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Code	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	Iv	RS	285	-----	565	mcd	
		GH	900	-----	1800		
		BH	180	-----	360		
Viewing Angle	$2\theta_{1/2}$		-----	120	-----	Deg	
Peak Wavelength	λ p	RS	-----	632	-----	nm	@V_{DD}=5V (DIMMING[4:0]=1F OUT_R/G/B[7:0]=FF)
		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

RS
Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
T2	285	450	mcd	OUT_R [7:0]=8b'11111111
U1	450	565		

GH
Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
V2	900	1120	mcd	OUT_G [7:0]=8b'11111111
W1	1120	1420		
W2	1420	1800		

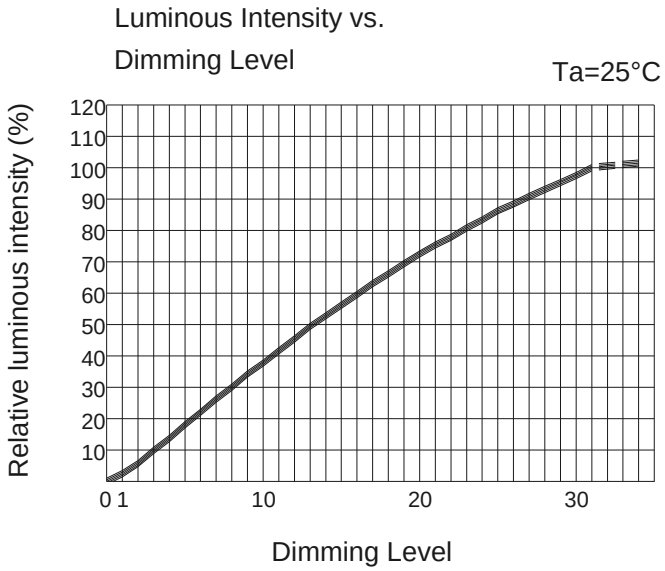
BH
Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
S1	180	225	mcd	OUT_B [7:0]=8b'11111111
S2	225	285		
T1	285	360		

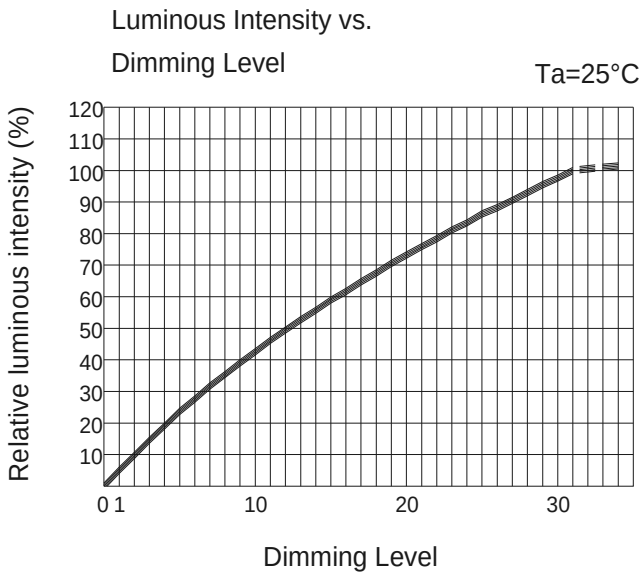
Note:
1. Tolerance of Luminous Intensity: ±11%

Typical Electro-Optical Characteristics Curves

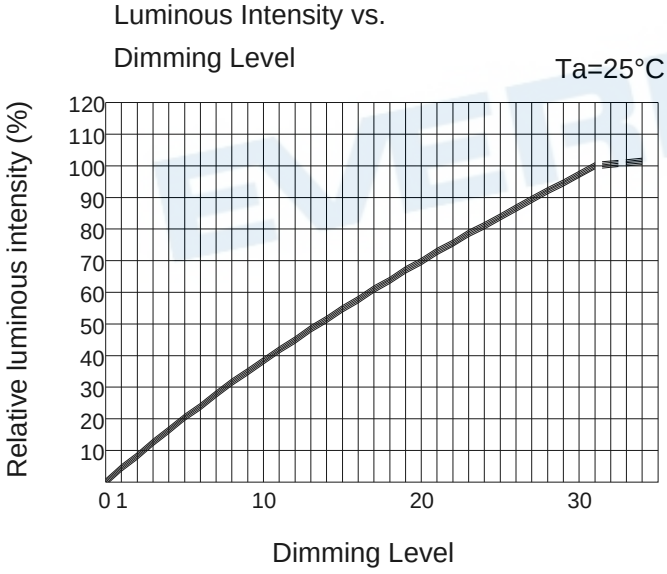
R



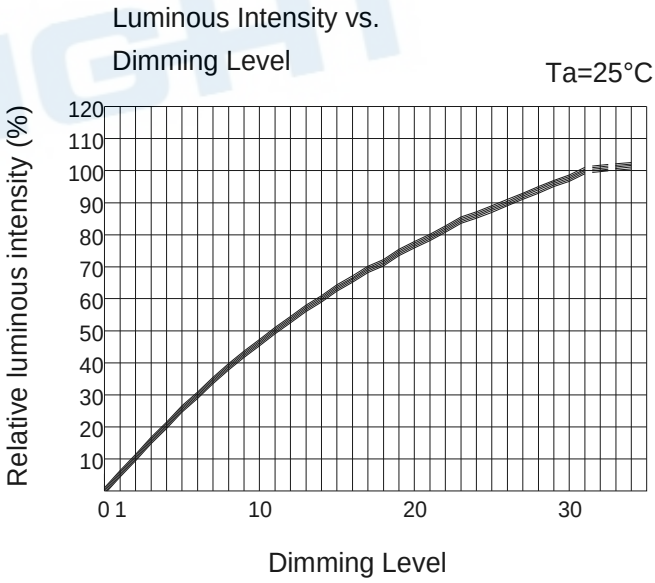
G



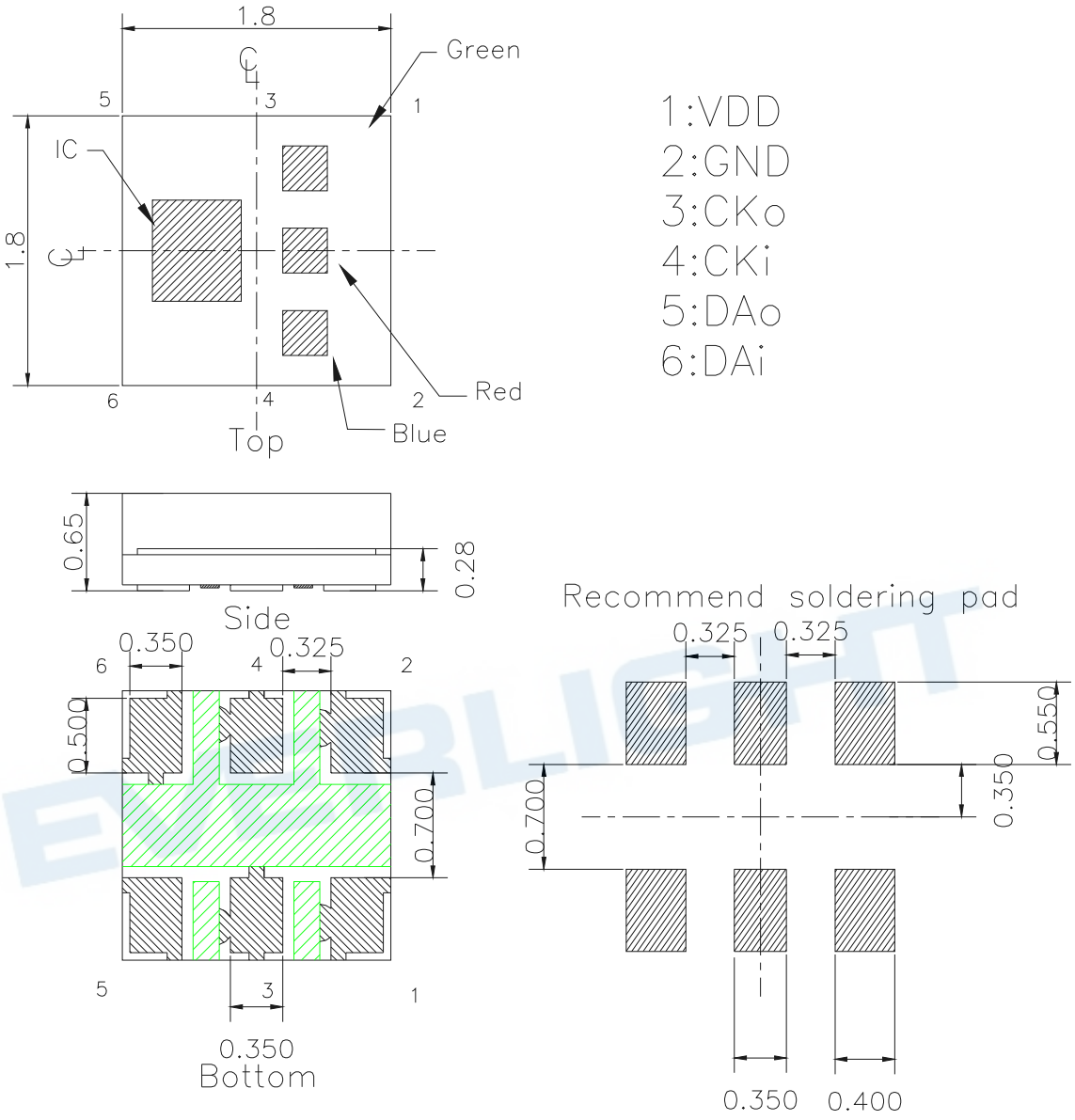
B



W



Package Dimension

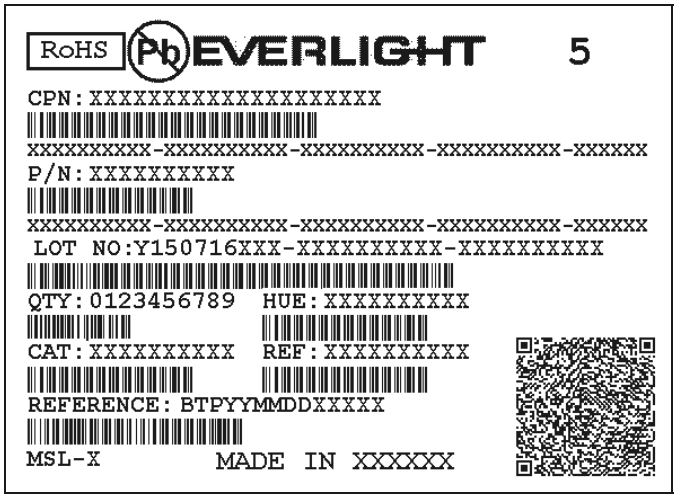


Note: Tolerances unless mentioned ±0.1mm. Unit = mm

PIN Function

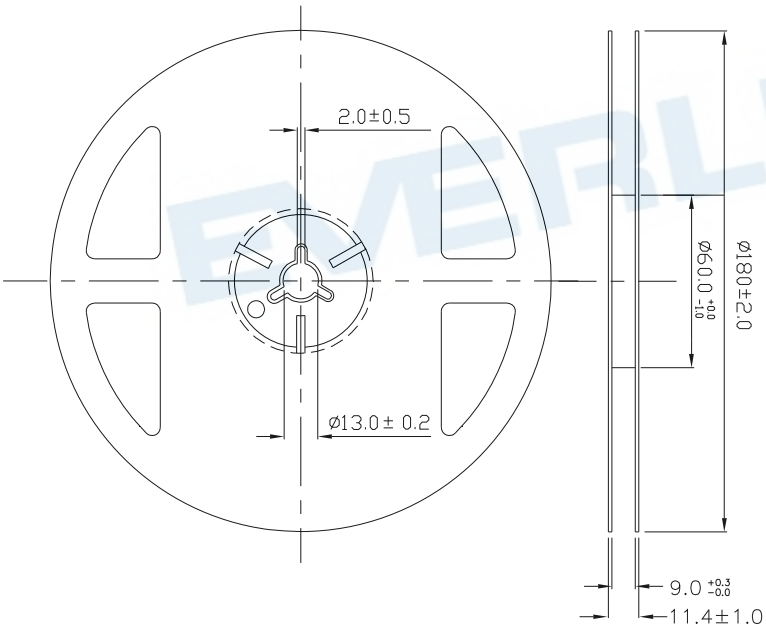
NO.	Symbol	Function description
1	VDD	Power Supply
2	GND	Ground
3	CKo	Clock output
4	CKi	Clock input
5	DAo	Serial data output
6	DAi	Serial data input

Moisture Resistant Packing Materials
Label Explanation



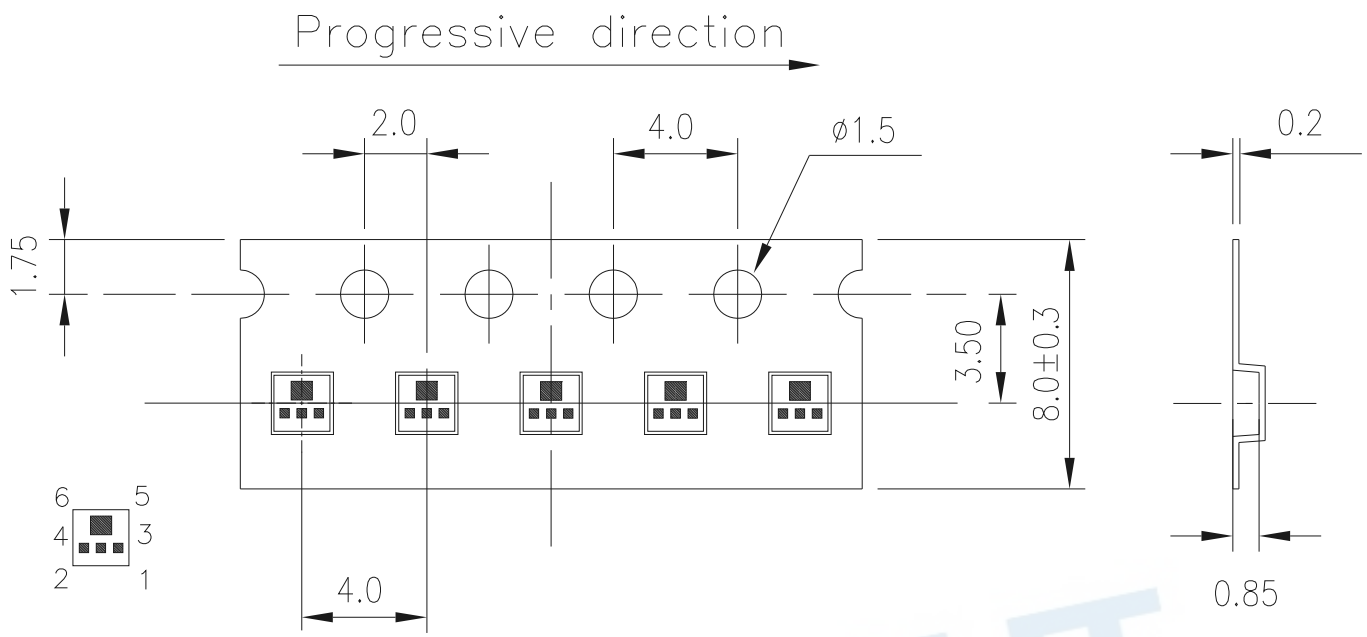
- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Chromaticity Coordinates & Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

Reel Dimensions



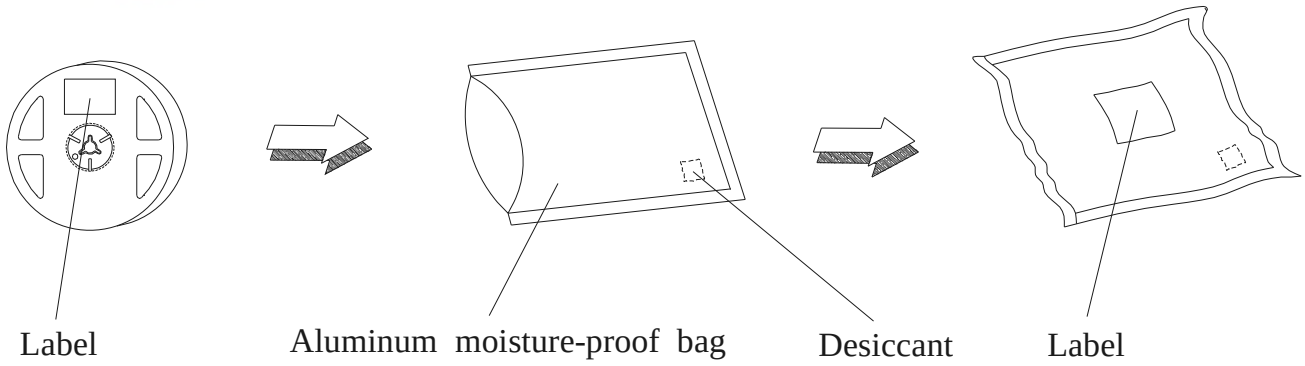
Note: The tolerances unless mentioned is ±0.1mm ,Unit = mm

The minimum quantity of packing is 2000 pcs per reel. The rest quantity which could not reach 2000 pcs per reel will goes to 500 pcs per reel.



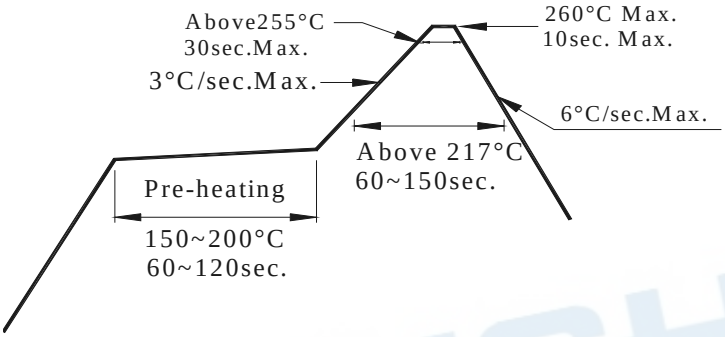
Note: The tolerances unless mentioned is ±0.1mm ,Unit = mm

Moisture Resistant Packaging



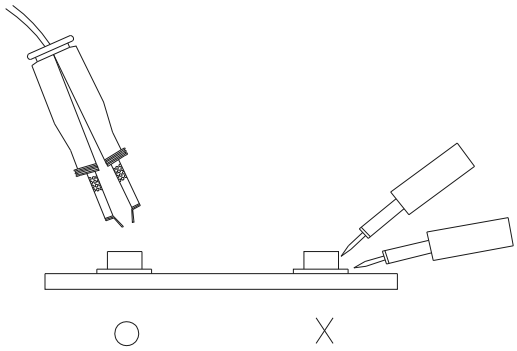
Precautions For Use

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 24hrs 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.



Application Restrictions

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

1. EVERLIGHT reserves the right(s) on the adjustment of product material mix for the specification.
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.
5. These specification sheets include materials protected under copyright of EVERLIGHT. Reproduction in any form is prohibited without obtaining EVERLIGHT's prior consent.
6. This product is not intended to be used for military, aircraft, automotive, medical, life sustaining or life saving applications or any other application which can result in human injury or death. Please contact authorized Everlight sales agent for special application request.