

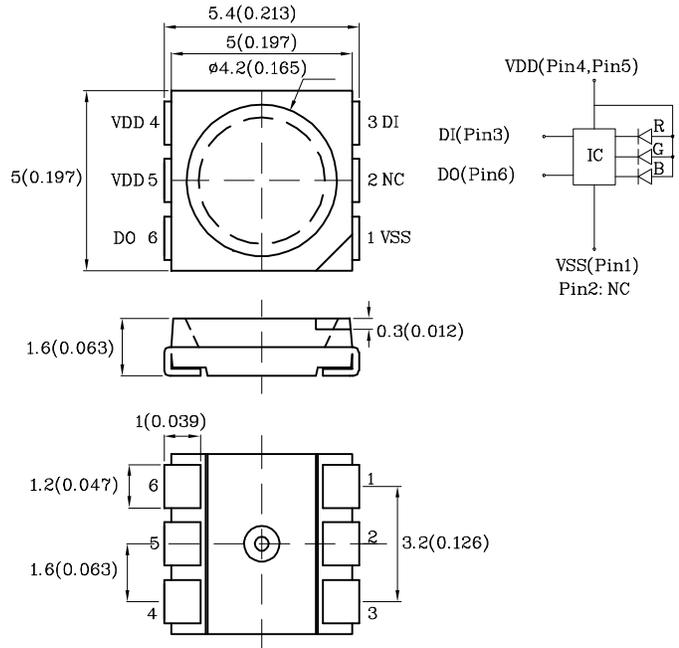
Features

- The control circuit and the LED share the same power source
- Intelligent protection against reverse connection
- Built-in electric reset and power lost reset Circuit
- 256-level grayscale adjustable circuit
- Built-in signal reshaping circuit
- Cascade port transmission signal by single line
- Standard Package: 500pcs/ Reel
- MSL (Moisture Sensitivity Level): 3
- Halogen-free
- RoHS compliant

Descriptions

- An intelligent control LED light source that integrates the control circuit and RGB chips in a 5050 package for a complete control of pixel point
- Data protocol uses unipolar NRZ communication mode
- The control chip integrated in the LED enables a simple circuit, small size, and convenient installation

Package Schematics



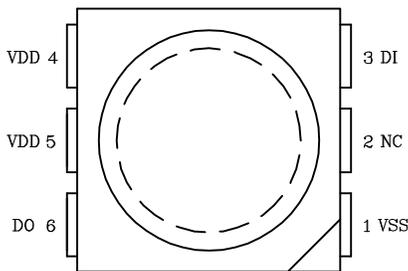
Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.2(0.008)$ " unless otherwise noted.
3. Specifications are subject to change without notice.



ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
DISCHARGE
SENSITIVE
DEVICES

Pin Configuration



Pin Function

No.	Symbol	Function Description
1	VSS	Ground
2	NC	/
3	DI	Control data signal input
4	VDD	Power supply LED
5	VDD	Power supply LED
6	DO	Control data signal output

Part Number	Emitting Color	Emitting Material	Lens-color	Wavelength	Wavelength	I _v (mcd) @ V _{DD} = 5V, Gray Scale Level = 255		Viewing Angle 201/2
				CIE127-2007* nm λ P	CIE127-2007* nm λ D	min.	typ.	
XZM2CRKDGKCBD107S-IC	Red	AlGaInP	Water Clear	640*	625*	200*	357*	120°
	Green	InGaN		515*	525*	400*	597*	
	Blue	InGaN		460*	465*	80*	148*	

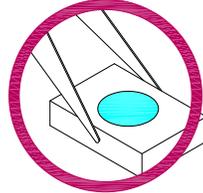
*Luminous intensity value and wavelength are in accordance with CIE127-2007 standards.

Handling Precautions

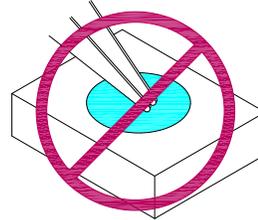
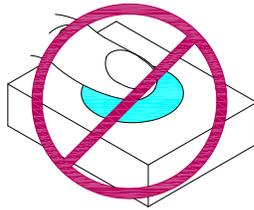
Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force.

As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

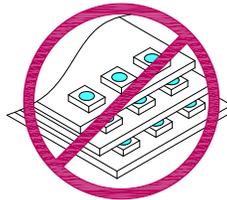
1. Handle the component along the side surfaces by using forceps or appropriate tools.



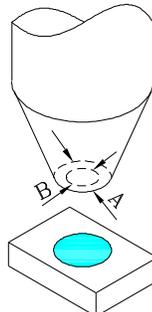
2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry.



3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry.



- 4.1. The inner diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks.
- 4.2. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup.
- 4.3. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production.



5. As silicone encapsulation is permeable to gases, some corrosive substances such as H_2S might corrode silver plating of leadframe. Special care should be taken if an LED with silicone encapsulation is to be used near such substances.

Absolute Maximum Ratings at $T_A=25^{\circ}\text{C}$

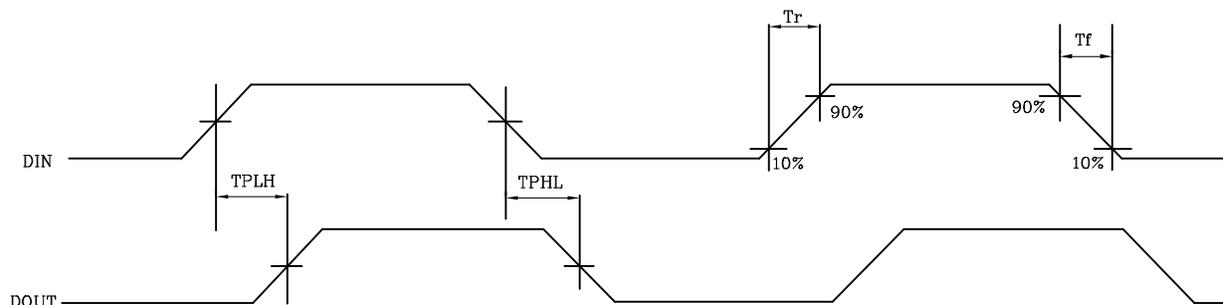
Parameter	Symbol	Ratings	Unit
Power Supply Voltage	V_{DD}	+3.5~+5.5	V
Input Voltage	V_I	-0.5~ $V_{DD}+0.5$	V
Operating Temperature	T_{op}	-40 ~ + 85	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40 ~ + 115	$^{\circ}\text{C}$
EST Pressure	V_{ESD}	4000	V

Electrical Characteristics ($T_A=-20\sim+70^{\circ}\text{C}$, $V_{DD}=+4.5\sim+5.5\text{V}$, $V_{SS}=0\text{V}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	V_{DD}	-	-	5	-	V
R / G / B Port Pressure	V_{DS}	-	-	-	26	V
R / G / B Port Drive Current	$I_{OUT_R/G/B}$	$V_{DS_R/G/B}$	-	12	-	mA
The Signal Input Flip Threshold	V_{IH}	$V_{DD}=5\text{V}$	-	3.4	-	V
	V_{IL}		-	1.6	-	V
The Frequency of PWM	F_{PWM}	-	-	1.2	-	KHZ
Static Power Consumption	I_{DD}	-	-	1	-	mA

Dynamic Characteristics at $T_A=25^{\circ}\text{C}$

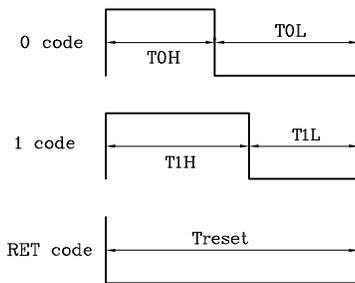
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Operation Frequency	F_{DIN}	The Duty Ratio of 67%(Data 1)	-	800	-	KHZ
Transmission Delay Time	T_{PLH}	DIN \rightarrow DOUT	-	-	500	ns
	T_{PHL}		-	-	500	ns
I_{OUT} Time	T_R	$V_{DS}=1.5\text{V}$ $I_{OUT}=12\text{mA}$	-	70	-	ns
	T_F		-	100	-	ns



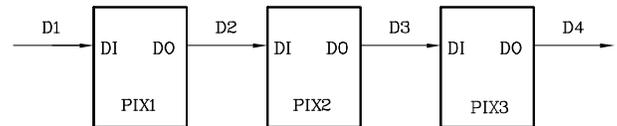
Data Transfer Time (TH+TL=1.25μs±600ns)

T0H	0 code, high voltage time	0.3μs	±150ns
T1H	1 code, high voltage time	0.6μs	±150ns
T0L	0 code, low voltage time	0.9μs	±150ns
T1L	1 code, low voltage time	0.6μs	±150ns
RES	low voltage time	80μs	-

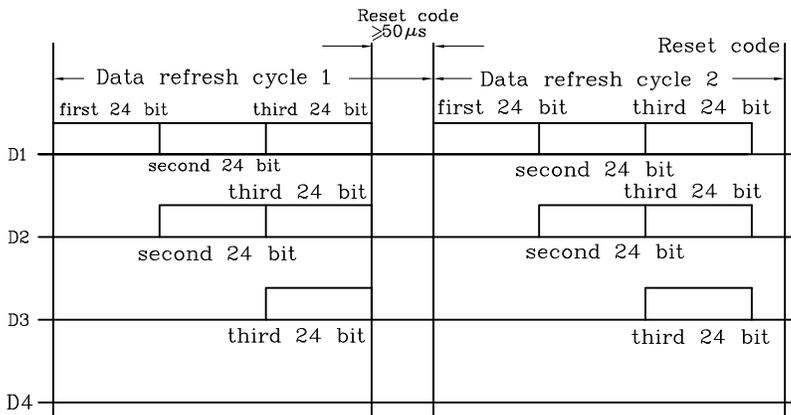
Sequence Chart



Cascade Method

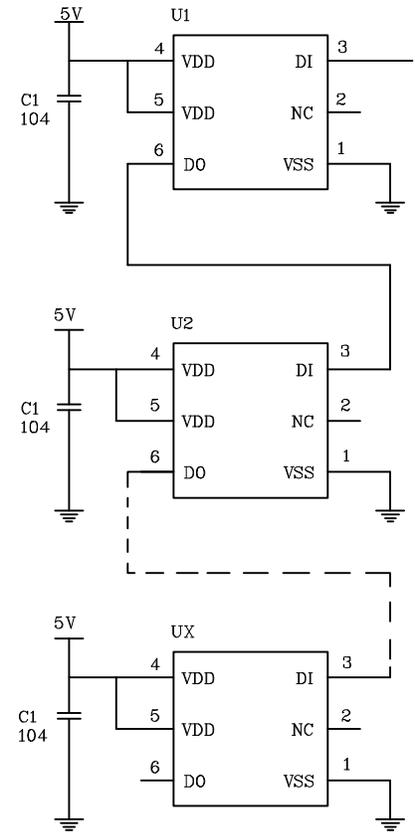


Data Transmission Method



Note: The data of D1 is sent by MCU, and D2,D3,D4 through pixel internal reshaping amplification to transmit.

Typical Application Circuit



Composition of 24bit Data

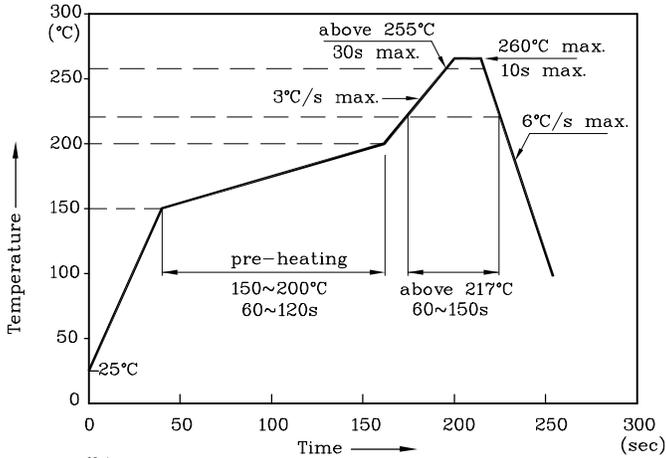
G7	G6	G5	G4	G3	G2	G1	G0	R7	R6	R5	R4	R3	R2	R1	R0	B7	B6	B5	B4	B3	B2	B1	B0
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Note: Follow the order of GRB to send data and the high bit is sent first.

LED is recommended for reflow soldering and soldering profile is shown below.

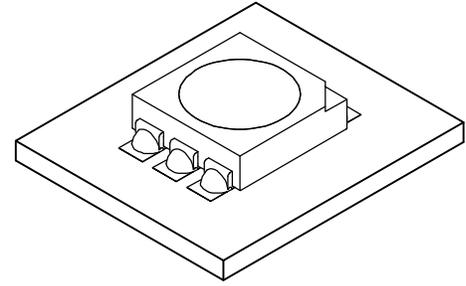
❖ The device has a single mounting surface. The device must be mounted according to the specifications.

Reflow Soldering Profile for SMD Products (Pb-Free Components)

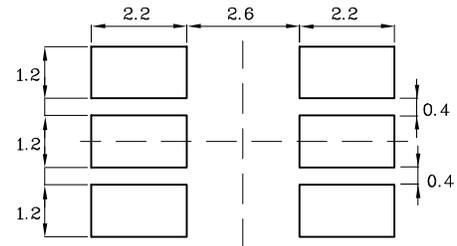


Notes:

1. All temperatures refer to the center of the package, measured on the package body surface facing up during reflow.
2. Do not apply any stress to the LED during high temperature conditions.
3. Maximum number of soldering passes: 2

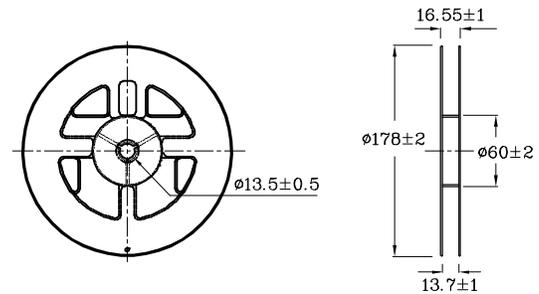
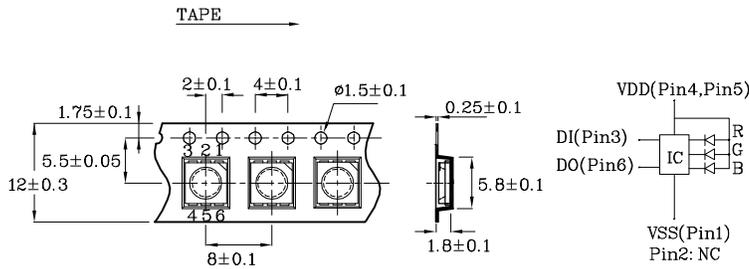


❖ Recommended Soldering Pattern (Units : mm; Tolerance: ± 0.1)



❖ Tape Specification (Units : mm)

❖ Reel Dimension (Units : mm)



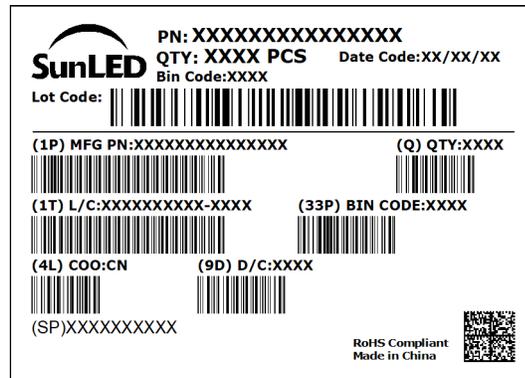
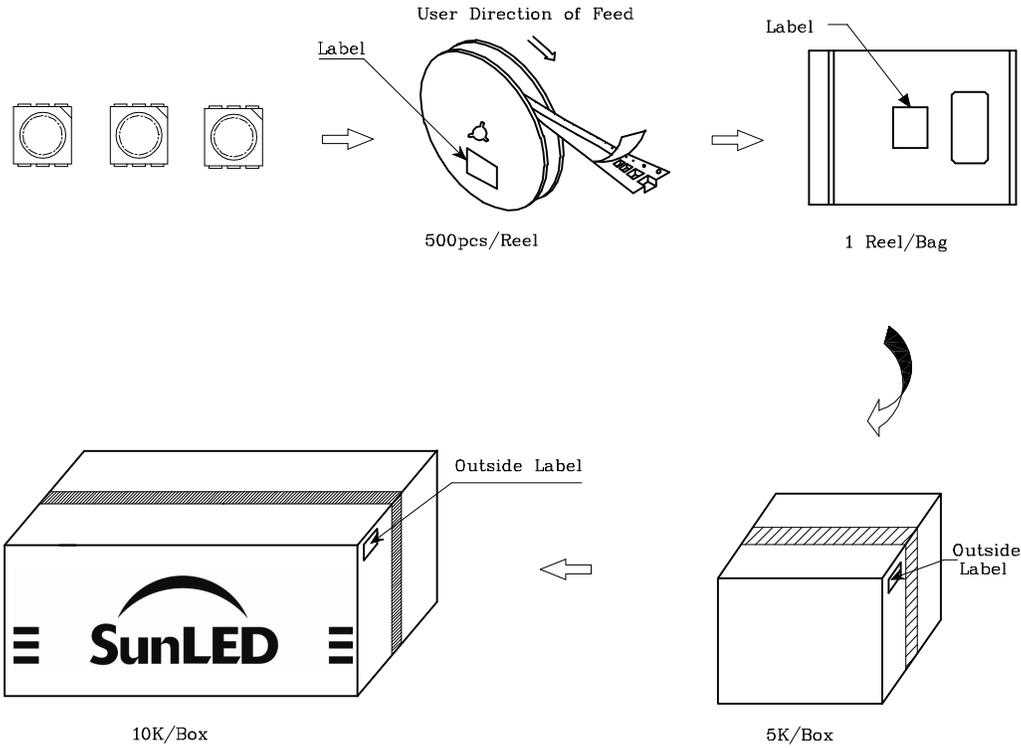
Remarks:

If special sorting is required (e.g. binning based on forward voltage, Luminous intensity / luminous flux, or wavelength), the typical accuracy of the sorting process is as follows:

1. Wavelength: +/-1nm
2. Luminous intensity / luminous flux: +/-15%
3. Forward Voltage: +/-0.1V

Note: Accuracy may depend on the sorting parameters.

PACKING & LABEL SPECIFICATIONS



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