

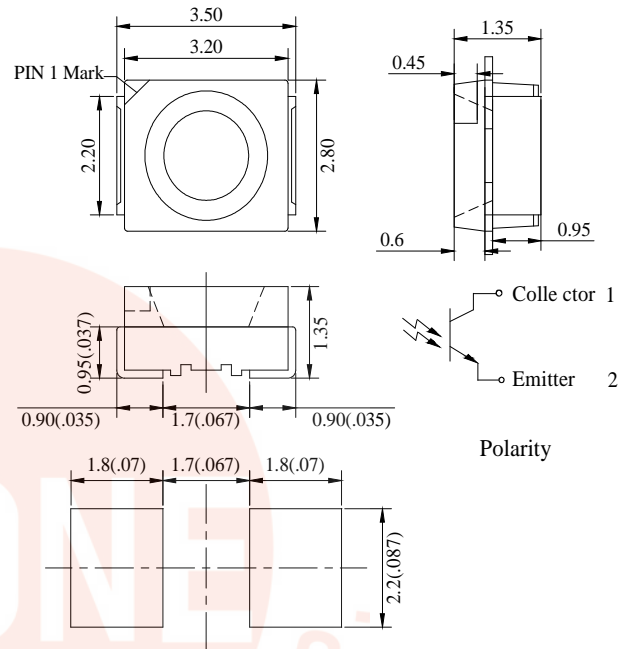
● Features:

1. Wide range of collector current.
2. High sensitivity.
3. Lens Appearance: Water Clear.
4. 3.5x2.8x1.35mm standard package
5. Suitable for all SMT assembly methods.
6. Compatible with infrared and vapor phase reflow solder process.
7. Compatible with automatic placement equipment.
8. This product doesn't contain restriction Substance, comply ROHS standard.

● Applications:

1. Automotive : Dashboards, stop lamps, turn signals.
2. Backlighting : LCDs, Key pads advertising.
3. Status indicators : Consumer & industrial electronics.
4. General use.

● Package Dimensions:



NOTES:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.10\text{mm}$  (0.004") unless otherwise specified.
3. Specifications are subject to change without notice.

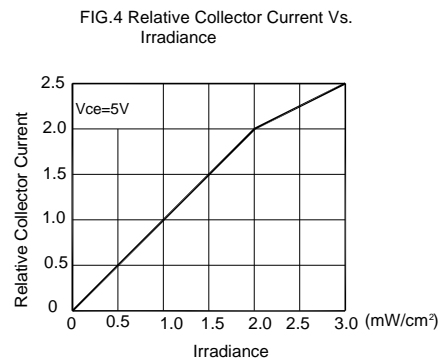
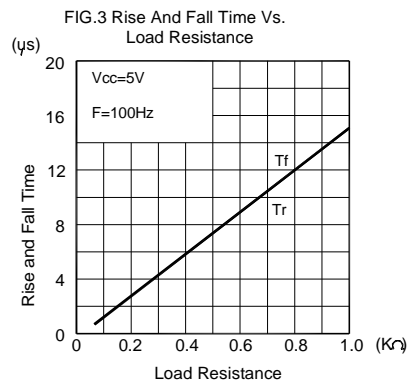
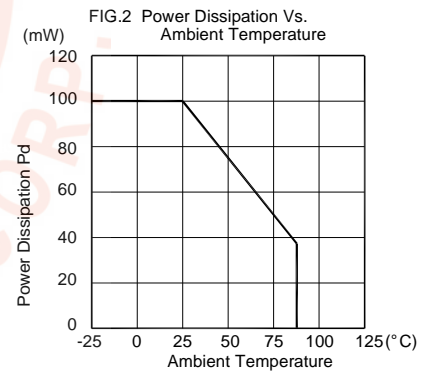
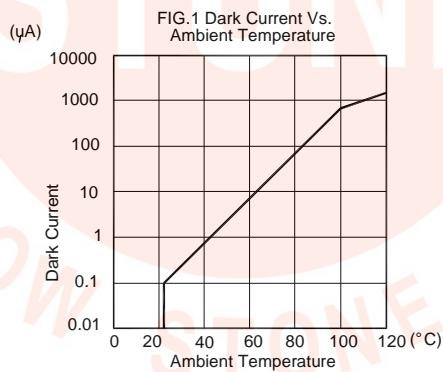
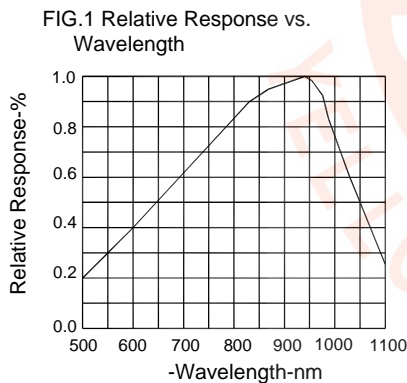
● Absolute Maximum Ratings( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Rating	Unit
Power Dissipation	$P_d$	100	mW
Collector- Emitter Voltage	$BV_{CEO}$	30	
Emitter- Collector Voltage	$BV_{ECO}$	5	V
Operating Temperature	$T_{opr}$	$-40^\circ\text{C} \sim 85^\circ\text{C}$	-
Storage Temperature	$T_{stg}$	$-40^\circ\text{C} \sim 100^\circ\text{C}$	-
Soldering Temperature	$T_{sol}$	See Page 6	-

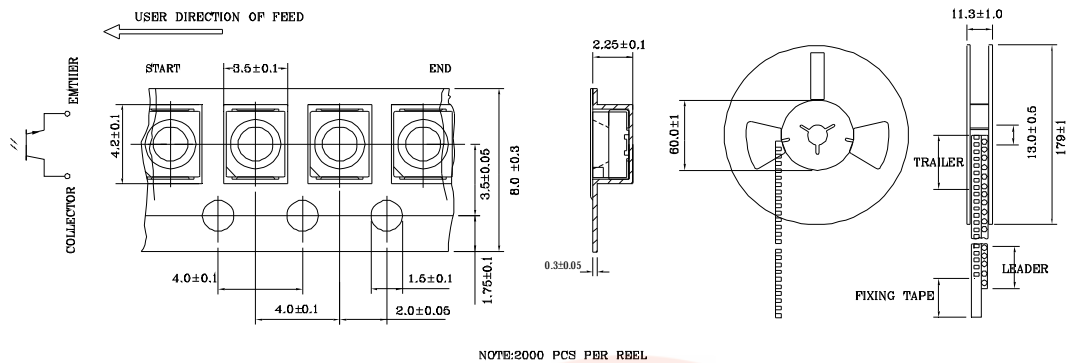
● Electrical and optical characteristics(Ta=25°C)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Sensitivity wave width	$\lambda$	500	-	1000	nm	$I_F=50mA$
Photosensitive peak wavelength	$\lambda_p$	-	940	-	nm	$I_F=50mA$
Collector- Emitter Breakdown Voltage	$V_{(BR)CEO}$	30	-	-	V	$I_C=0.1mA$ $E_e=0mW/cm^2$
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	5	-	-	V	$I_R=0.1mA$ $E_e=0 mW/cm^2$
Collector- Emitter Saturation Voltage	$V_{CE(SAT)}$	-	-	0.5	V	$I_C=0.1mA$ $E_e=1.0 mW/cm^2$
Rise Time	$T_r$	-	15	-	$\mu S$	$V_{CC}=5V$ $R_L=1K\Omega$ $I_C=1mA$
Fall Time	$T_f$	-	15	-	$\mu S$	$V_{CC}=5V$ $R_L=1K\Omega$ $I_C=1mA$
Collector Dark Current	$I_{CEO}$	-	-	0.1	$\mu A$	$V_{CE}=10V$ $E_e=0 mW/cm^2$
On State Collector Current	$I_{C(ON)}$	4.976	7.165	-	mA	$V_{CE}=5V$ , $\lambda_p=940nm$ , $H=1.0mw/cm^2$

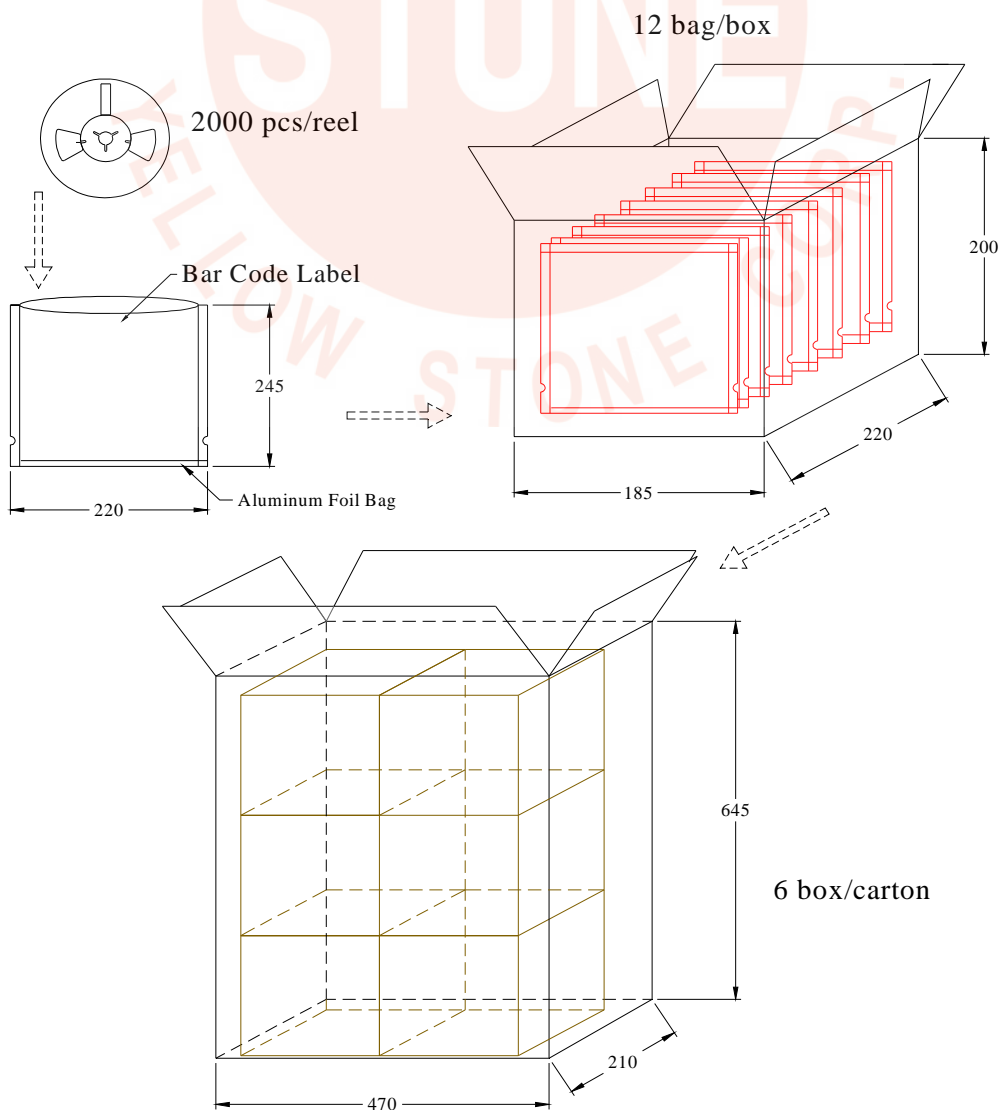
● Typical Electro-Optical Characteristics Curves.



● Tapping and packaging specifications(Units: mm)



● Package Method:(unit:mm)





---

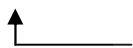
### Intensity Bin Limits

Collector Light Current Bin Limits( $V_{CE}=5V$ ,  $H=1.0\text{mw/cm}^2$ )

BIN CODE	$I_{C(ON)}$ (mA)	
	Min	Max
P	4.976	7.165
Q	7.165	10.319
R	10.319	14.859

Tolerance for each Bin limit is  $\pm 15\%$

● BIN : x



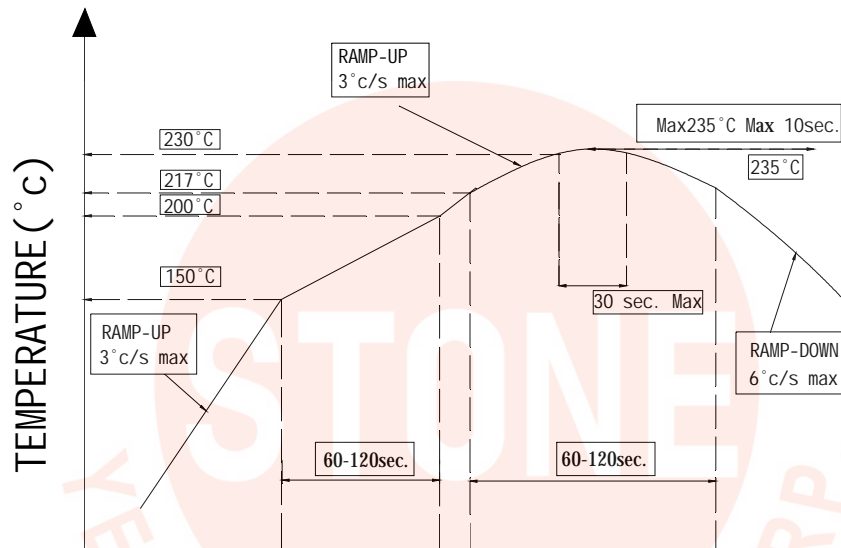
Collector Light Current Bin Code

● Reliability Test

Classification	Test Item	Reference Standard	Test Conditions	Result
Endurance Test	Operation Life	MIL-STD-750:1026 MIL-STD-883:1005 JIS-C-7021 :B-1	$I_F=50\text{mA}$ $T_a=\text{Under room temperature}$ Test time=1,000hrs	0/20
	High Temperature High Humidity Storage	MIL-STD-202:103B JIS-C-7021 :B-11	$T_a=+65^{\circ}\text{C}\pm 5^{\circ}\text{C}$ RH=90%-95% Test time=240hrs	0/20
	High Temperature Storage	MIL-STD-883:1008 JIS-C-7021 :B-10	High $T_a=+85^{\circ}\text{C}\pm 5^{\circ}\text{C}$ Test time=1,000hrs	0/20
	Low Temperature Storage	JIS-C-7021 :B-12	Low $T_a=-35^{\circ}\text{C}\pm 5^{\circ}\text{C}$ Test time=1,000hrs	0/20
Environmental Test	Temperature Cycling	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS-C-7021 :A-4	$-35^{\circ}\text{C} \sim +25^{\circ}\text{C} \sim +85^{\circ}\text{C} \sim +25^{\circ}\text{C}$ 60min 20min 60min 20min Test Time=5cycle	0/20
	Thermal Shock	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011	$-35^{\circ}\text{C}\pm 5^{\circ}\text{C} \sim +85^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 20min 20min Test Time=10cycle	0/20
	Solder Resistance	MIL-STD-202:201A MIL-STD-750:2031 JIS-C-7021 :A-1	Preheating : $140^{\circ}\text{C}-160^{\circ}\text{C}$ , within 2 minutes. Operation heating : $260^{\circ}\text{C}$ (Max.), within 10seconds. (Max.)	0/20

- Note: 1. U means the upper limit of specified characteristics. S means initial value.
2. After each test, remove test pieces, wait for 2 hours and test pieces have returned to ambient temperature, then take next measurement.

## ● IR-Reflow Soldering



1. Avoid any external stress applied to the resin while the LEDs are at high temperature, especially during soldering .
2. Avoid rapid cooling or any excess vibration during temperature ramp-down process
3. Although the soldering condition is recommended above, soldering at the lowest possible temperature is feasible for the LEDs

## ● IRON Soldering

**350°C Within 3 sec,one time only.**

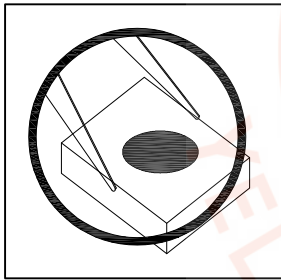
## ● Handling Precautions

Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible. Although its characteristic

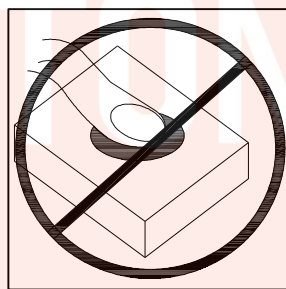
significantly reduces thermal stress, it is more susceptible to damage by external mechanical force. As a result, special handling precautions need to be observed during assembly using silicone encapsulated

LED products. Failure to comply might lead to damage and premature failure of the LED.

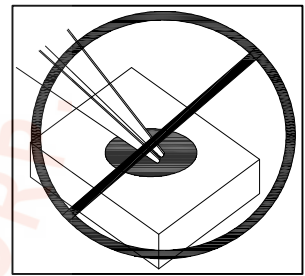
1. Handle the component along the side surfaces by using forceps or appropriate tools. (pic.1)
2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry. (pic.2, pic.3)
3. Do not stack together assembled PCBs containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry. (pic.4)
4. The outer diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks. The inner diameter of the nozzle should be as large as possible. (pic.5)
5. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup. (pic.5)
6. The dimensions of the component must be accurately programmed in the pick-and-place machine to ensure precise pickup and avoid damage during production. (pic.5)



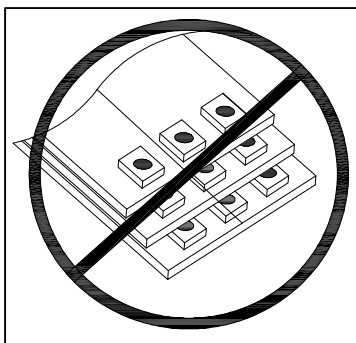
**Pic.1**



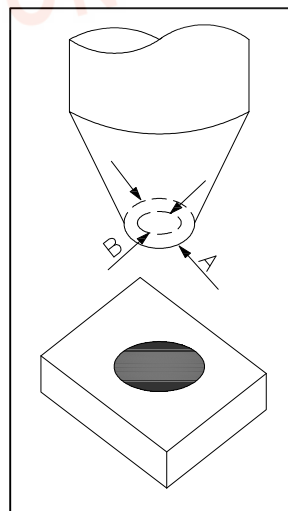
**Pic.2**



**Pic.3**



**Pic.4**



**Pic.5**



● Notes for designing:

Care must be taken to provide the current limiting resistor in the circuit so as to drive the LEDs within the rated figures. Also, caution should be taken not to overload LEDs with instantaneous voltage at the turning ON and OFF of the circuit.

When using the pulse drive care must be taken to keep the average current within the rated figures. Also, the circuit should be designed so as to be subjected to reverse voltage when turning off the LEDs.

● Storage:

In order to avoid the absorption of moisture, it is recommended to solder LEDs as soon as possible after unpacking the sealed envelope.

If the envelope is still packed, to store it in the environment as following:

- (1) Temperature : 5°C-30°C(41°F) Humidity : RH 60% Max.
- (2) After this bag is opened, devices that will be applied to infrared reflow, vapor-phase reflow, or equivalent soldering process must be:
  - a. Completed within 24 hours.
  - b. Stored at less than 20% RH.
- (3) Devices require baking before mounting, if:  
2a or 2b is not met.
- (4) If baking is required, devices must be baked under below conditions:  
48 hours at 60°C±5°C.

● Package and Label of Products:

- (1) Package: Products are packed in one bag of 2000 pcs (one taping reel) and a label is attached on each bag.
- (2) Label:

