S170PTD-1AX

2.0x1.25mm, Phototransistor

phototransistor detector in a 0805 SMD type package.

Technical Data Sheet

Features:

- Fast response time.
- High photo sensitivity.
- Small junction capacitance.
- Package in 8mm tape on 7” diameter reel.
- The product itself will remain within RoHS compliant Version.

Descriptions:

- The S170PT is a high speed and high sensitive silicon NPN phototransistor in miniature SMD package which is molded in a water clear epoxy with flat top view lens.
- Due to its water clear epoxy, the device is spectrally matched to visible and infrared emitting diode.

Applications:

- Automatic door sensor.
- Infrared applied system.
- Counters and sorters.
- Encoders.
- Floppy disk drive.
- Optoelectronic switch.
- Video camera, tape and card readers.
- Position sensors.
- Copier.
- Game machine.

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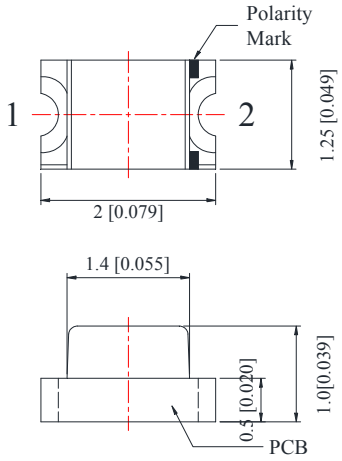
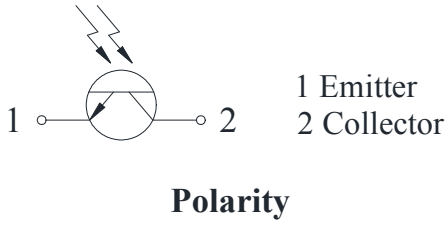
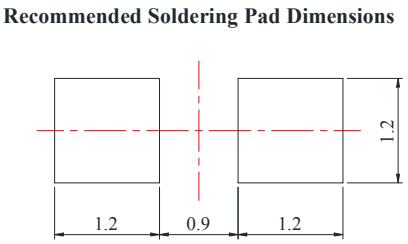
Technical Data Sheet

Part No.	Emitting Color	Lens Color
S170PTD-1AX	Phototransistor	Black

Package Dimension:







Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010″) unless otherwise noted.

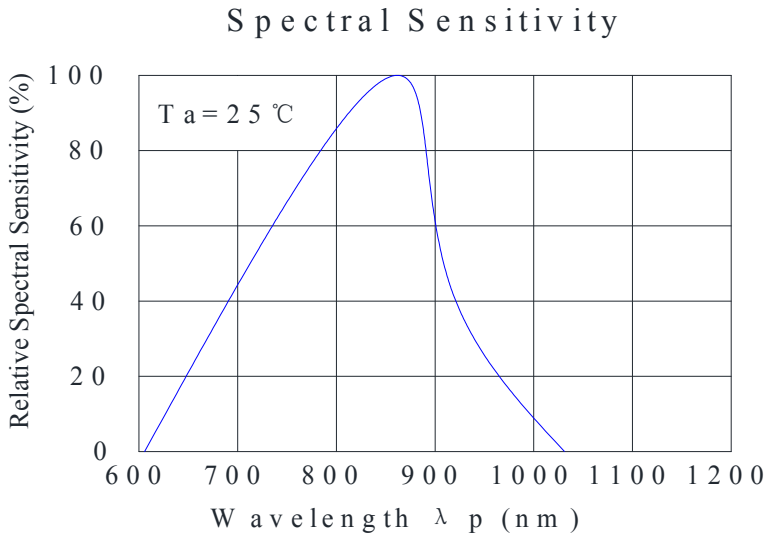
Absolute Maximum Ratings at Ta=25℃

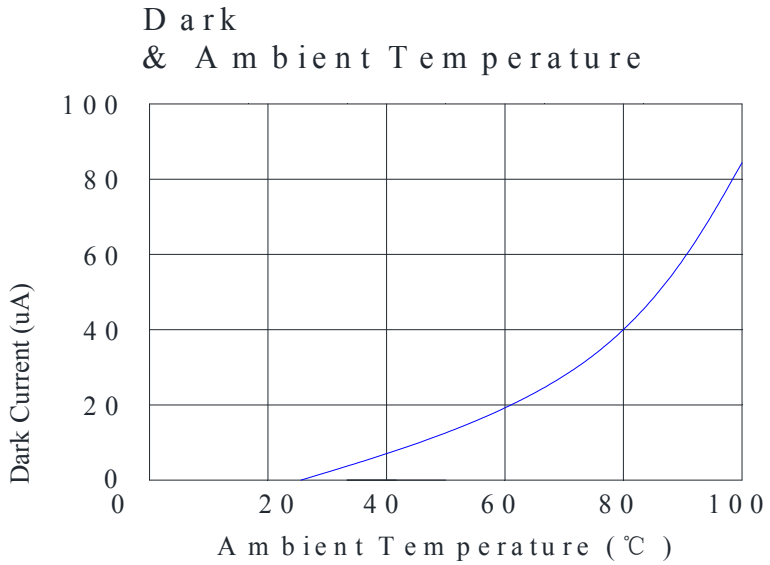
Parameters	Symbol	Max	Unit
Power Dissipation	Pd	70	mW
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector-Voltage	V_{ECO}	5	V
Operating Temperature Range	Topr	-40℃ to +85℃	
Storage Temperature Range	Tstg	-40℃ to +100℃	
Soldering Temperature	Tsld	260℃ for 5 Seconds	

Electrical Optical Characteristics at Ta=25℃

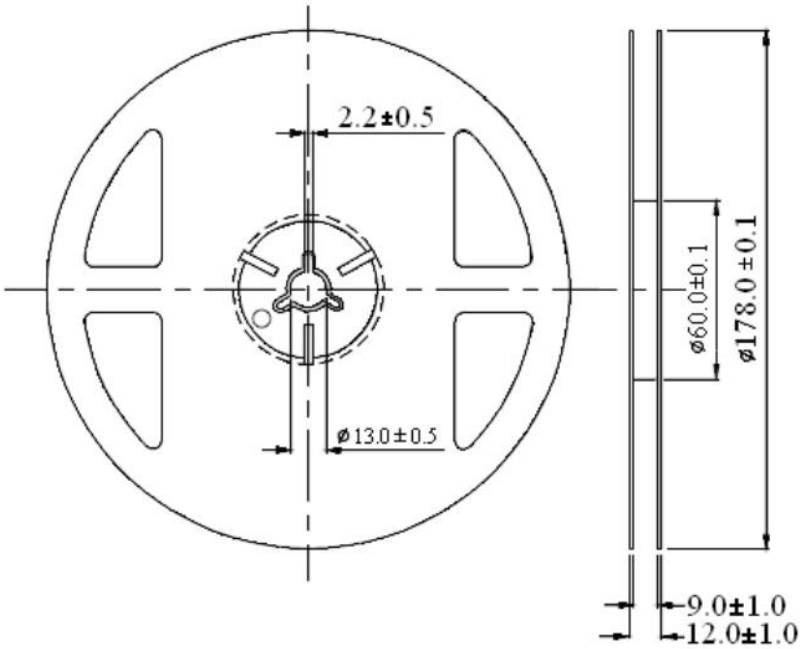
Parameters	Symbol	Min.	Typ.	Max.	Unit	Condition
On State Collector Current	$IL_{(ON)}$	0.2	0.3	0.4	mA	VCE=5V,λP=850nm H=1mW/cm²
Collector Dark Current	I_{CEO}	---	---	0.2	μA	VCE=5V Ev=0Lux
Optical Rise Time (10% to 90%)	TR	---	15	---	μs	VCE=5V, IC=1mA, RL=1000Ω
Optical Fall Time (90% to 10%)	TF	---	15	---		
Collecto Emitter saturation voltage	Vce (sat)	---	---	0.4	V	IC=2mA Ee=1mW/cm2
Reception Angle	2θ1/2	---	120	---	Deg	---
Wavelength Of Peak Sensitivity	λP	---	850	---	nm	---
Rang Of Spectral Bandwidth	λ	700	---	1100	nm	---

Typical Electrical / Optical Characteristics Curves (25℃ Ambient Temperature Unless Otherwise Noted)





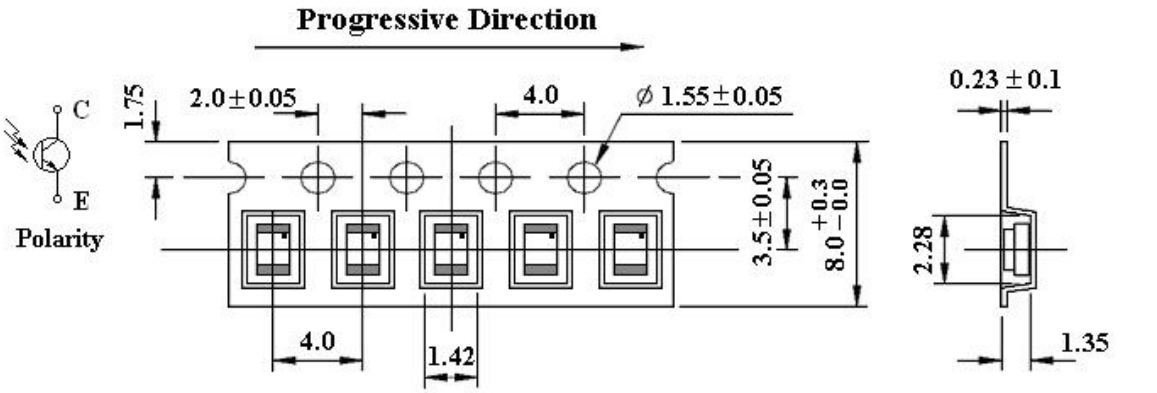
Reel Dimensions:



Unit: mm
Tolerance: ±0.25mm

Carrier Tape Dimensions:

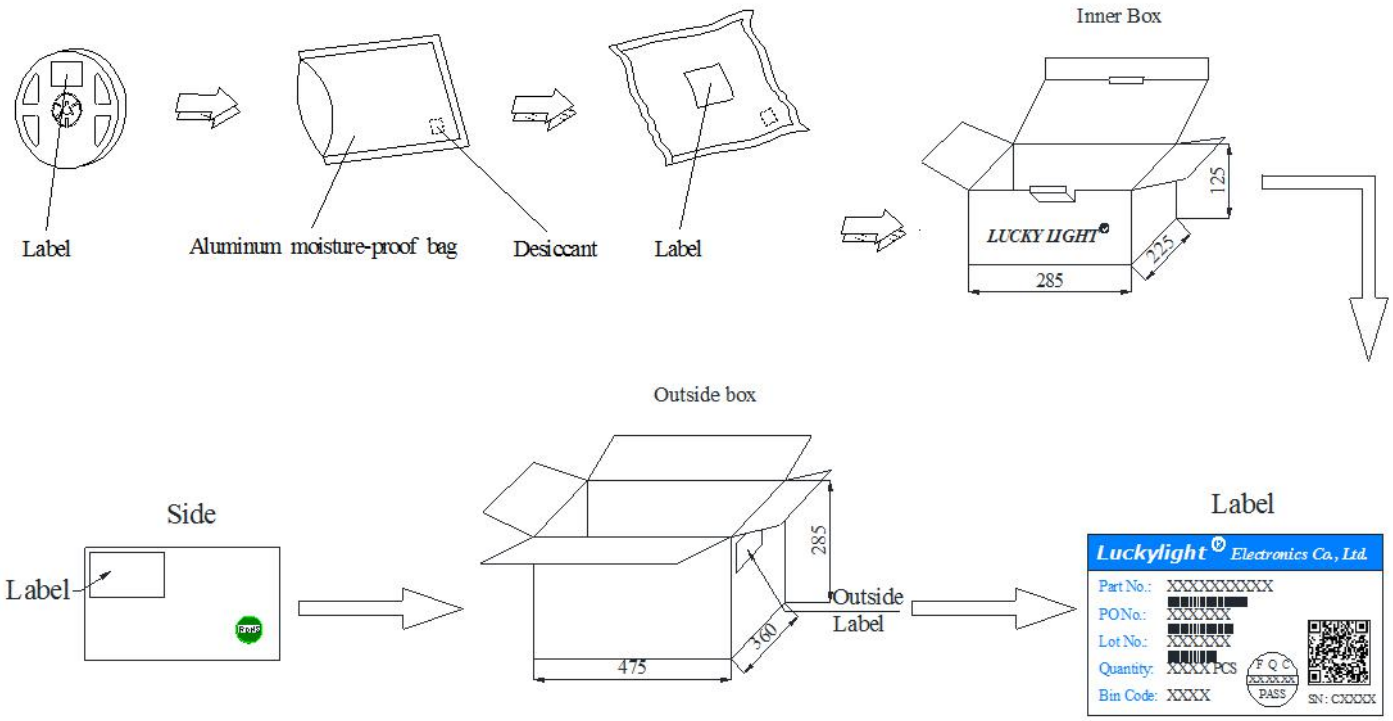
Loaded quantity 3000 pcs per reel.



Unit: mm
Tolerance: ±0.10mm

Packing & Label Specifications:

Moisture Resistant Packaging:



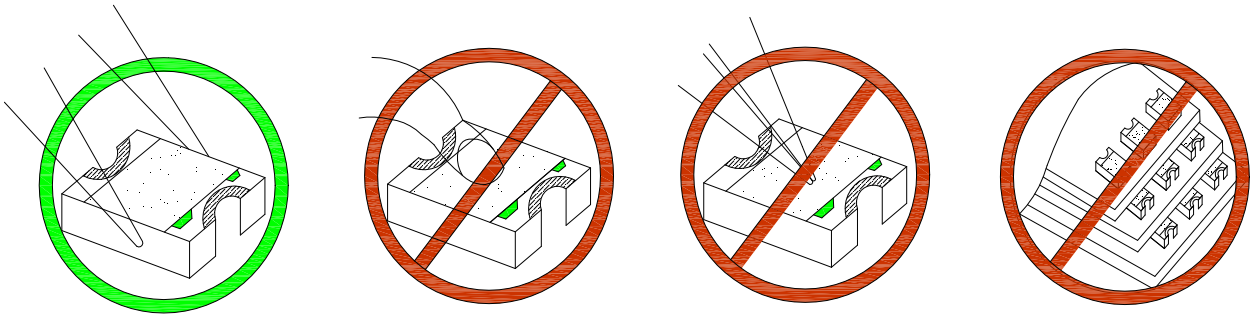
CAUTIONS

1. Handling Precautions:

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

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

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



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.

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 60%RH or less.

2.3. The LEDs should be used within a year.

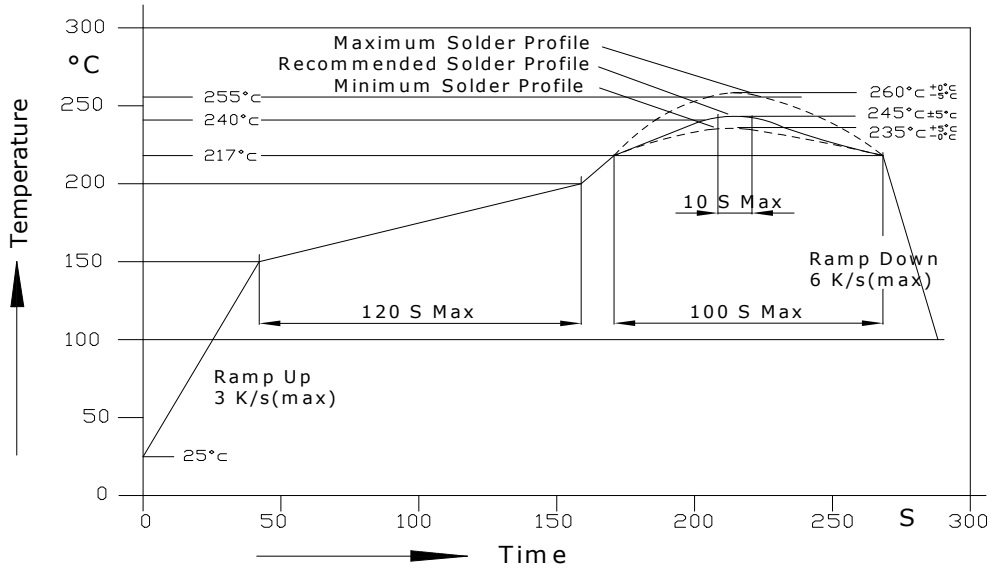
2.4. After opening the package, the LEDs should be kept at 30°C or less and 60%RH or less.

2.5. The LEDs should be used within 168 hours after opening the package.

2.6. If the moisture adsorbent material has fabled away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions. Baking treatment: 65±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.

3.5. Recommended soldering conditions:

Reflow soldering		Soldering iron	
Pre-heat	150~200°C	Temperature	300°C Max.
Pre-heat time	120 sec. Max.	Soldering time	3 sec. Max.
Peak temperature	260°C Max.		(one time only)
Soldering time	10 sec. Max.(Max. two times)		

3.6. Because different board designs use different number and types of devices, solder pastes, reflow ovens, and circuit boards, no single temperature profile works for all possible combinations.

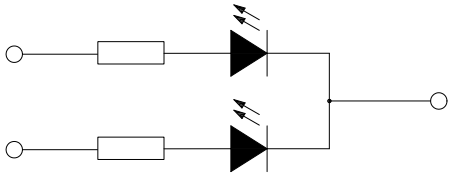
However, you can successfully mount your packages to the PCB by following the proper guidelines and PCB-specific characterization.

4. Drive Method:

4.1. An LED is a current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit, in series with each LED as shown in Circuit A below.

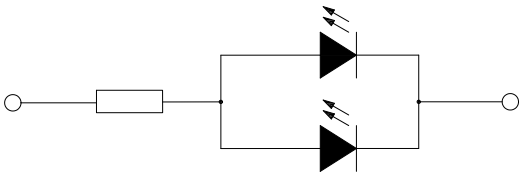
Circuit model A

LED



Circuit model B

LED



a. Recommended circuit.

b. The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs.

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