

## APT2012P3BT 2.0 x 1.25 mm Phototransistor

### DESCRIPTION

- Made with NPN silicon phototransistor chips

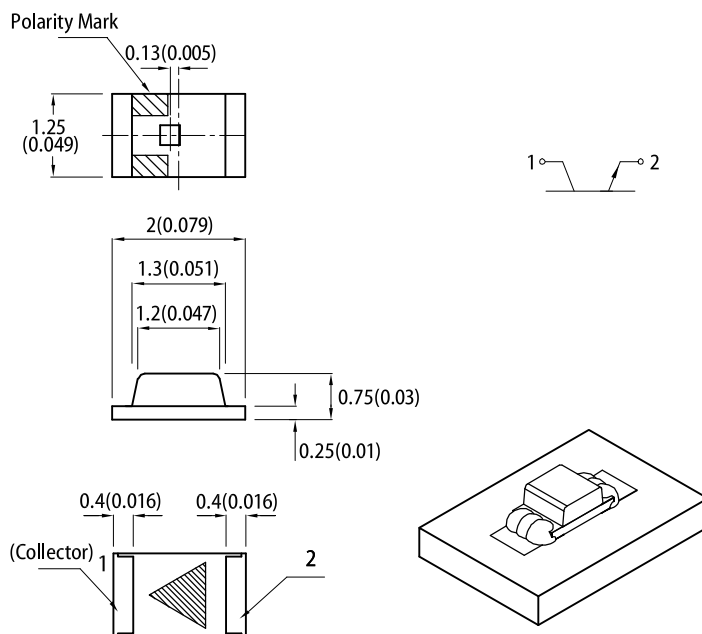
### FEATURES

- 2.0 mm x 1.25 mm SMD LED, 0.75 mm thickness
- Mechanically and spectrally matched to infrared emitting LED lamp
- Black diffused lens
- Package: 2000 pcs / reel
- Moisture sensitivity level: 3
- Halogen-free
- RoHS compliant

### APPLICATIONS

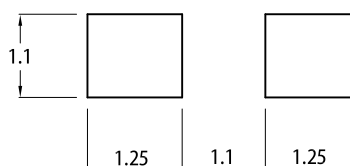
- Infrared applied systems
- Optoelectronic switches
- Photodetector control circuits
- Sensor technology

### PACKAGE DIMENSIONS



### RECOMMENDED SOLDERING PATTERN

(units : mm; tolerance : ± 0.1)



- Notes:
- All dimensions are in millimeters (inches).
  - Tolerance is ±0.1 (0.004") unless otherwise noted.
  - The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
  - The device has a single mounting surface. The device must be mounted according to the specifications.

### ABSOLUTE MAXIMUM RATINGS at T<sub>A</sub>=25°C

Parameter	Max.Ratings	Units
Collector-to-Emitter Voltage	30	V
Emitter-to-Collector Voltage	5	V
Power Dissipation at(or below) 25°C Free Air Temperature	100	mW
Operating Temperature	-40 to +85	°C
Storage Temperature	-40 to +85	°C

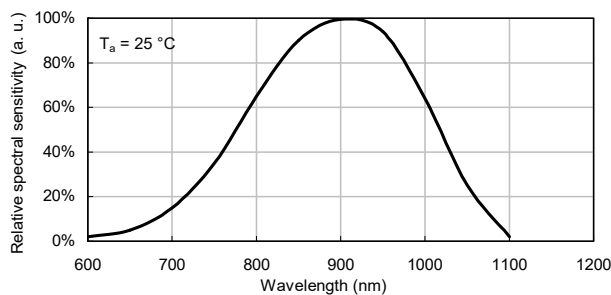
Note:  
1. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.

### ELECTRICAL / OPTICAL CHARACTERISTICS at $T_A=25^\circ\text{C}$

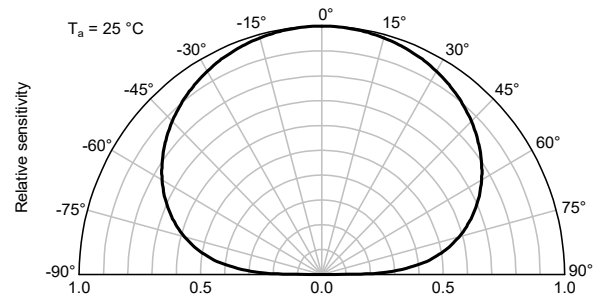
Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Collector-to-Emitter Breakdown Voltage	$V_{BR\ CE0}$	30	-	-	V	$I_C = 100\mu\text{A}$ $E_e = 0\text{mW/cm}^2$
Emitter-to-Collector Breakdown Voltage	$V_{BR\ EC0}$	5	-	-	V	$I_E = 100\mu\text{A}$ $E_e = 0\text{mW/cm}^2$
Collector-to-Emitter Saturation Voltage	$V_{CE(SAT)}$	-	-	0.8	V	$I_C = 2\text{mA}$ $E_e = 20\text{mW/cm}^2$
Collector Dark Current	$I_{CEO}$	-	-	100	nA	$V_{CE} = 10\text{V}$ $E_e = 0\text{mW/cm}^2$
Rise Time(10% to 90%)	$T_R$	-	15	-	$\mu\text{S}$	$V_{CE} = 5\text{V}$ $I_C = 1\text{mA}$ $R_L = 1000\Omega$
Fall Time(90% to 10%)	$T_F$	-	15	-	$\mu\text{S}$	
On State Collector Current	$I_{(ON)}$	0.1	0.3	-	mA	$V_{CE} = 5\text{V}$ $E_e = 1\text{mW/cm}^2$ $\lambda = 940\text{nm}$
Range of spectral bandwidth	$\lambda_{0.1}$	670	-	1070	nm	-
Wavelength of peak Sensitivity	$\lambda_p$	-	940	-	nm	-
Angle of half sensitivity	$2\theta_{1/2}$	-	160	-	deg	-

## TECHNICAL DATA

### RELATIVE SPECTRAL SENSITIVITY vs. WAVELENGTH



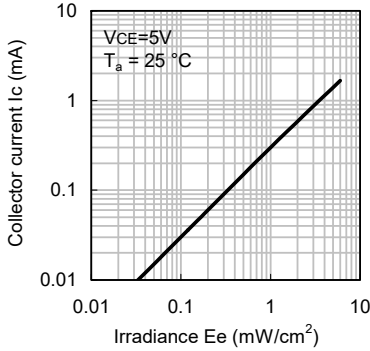
### RELATIVE RADIANT SENSITIVITY vs. ANGULAR DISPLACEMENT



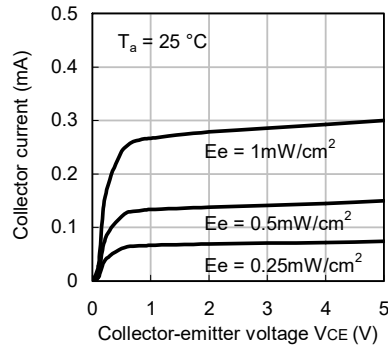
### TECHNICAL DATA

### PHOTOTRANSISTOR

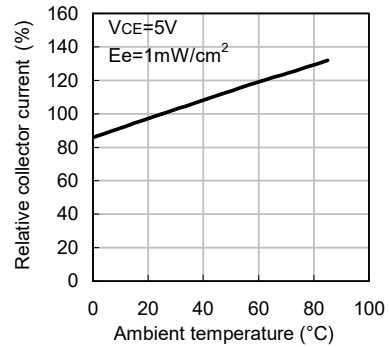
**Collector Current vs. Irradiance**



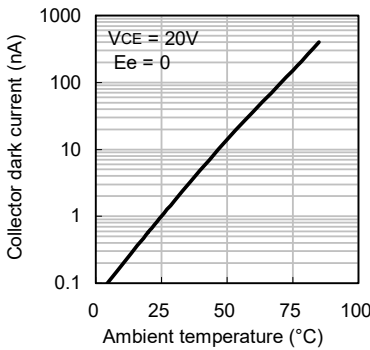
**Collector Current vs. Collector-Emitter Voltage**



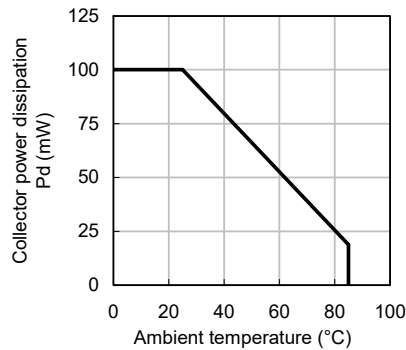
**Relative Collector Current vs. Ambient Temperature**



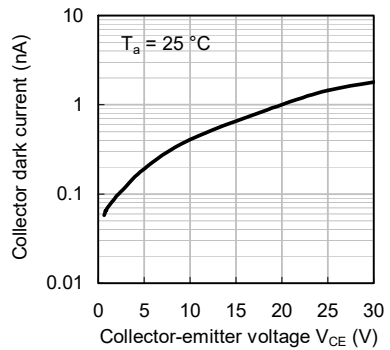
**Collector Dark Current vs. Ambient Temperature**



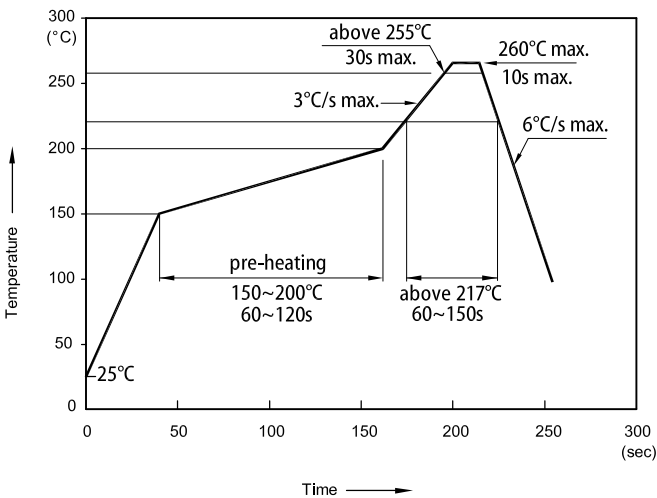
**Collector Power Dissipation vs. Ambient Temperature**



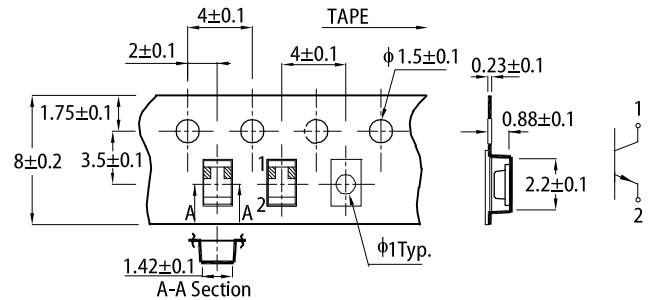
**Collector Dark Current vs. Collector-Emitter Voltage**



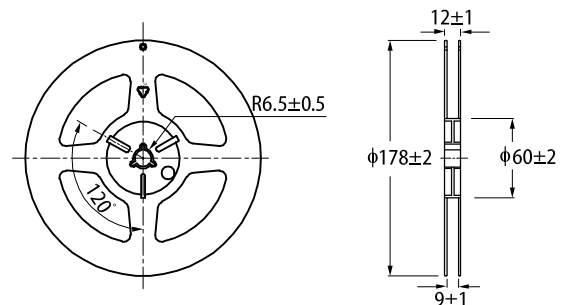
### REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS



### TAPE SPECIFICATIONS (units : mm)

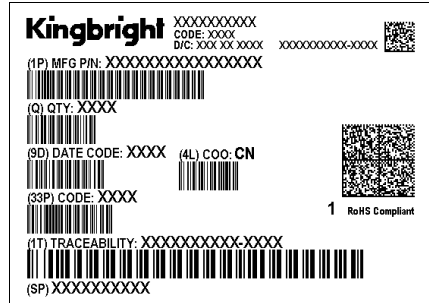
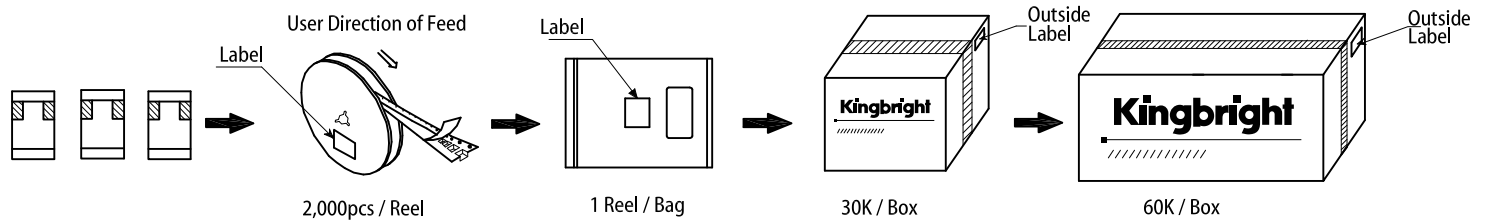


### REEL DIMENSION (units : mm)



- Notes:
1. Don't cause stress to the LEDs while it is exposed to high temperature.
  2. The maximum number of reflow soldering passes is 2 times.
  3. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.

## PACKING & LABEL SPECIFICATIONS



### PRECAUTIONARY NOTES

1. The information included in this document reflects representative usage scenarios and is intended for technical reference only.
2. The part number, type, and specifications mentioned in this document are subject to future change and improvement without notice. Before production usage customer should refer to the latest datasheet for the updated specifications.
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