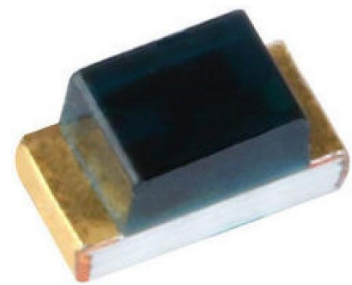


## Technical Data Sheet

### 0603 SMD Phototransistor: PT1921B

#### ■ Features

- . Fast response time
- . High photo sensitivity
- . Pb free
- . Compliance with EU REACH
- . The product itself will remain within RoHS compliant version.



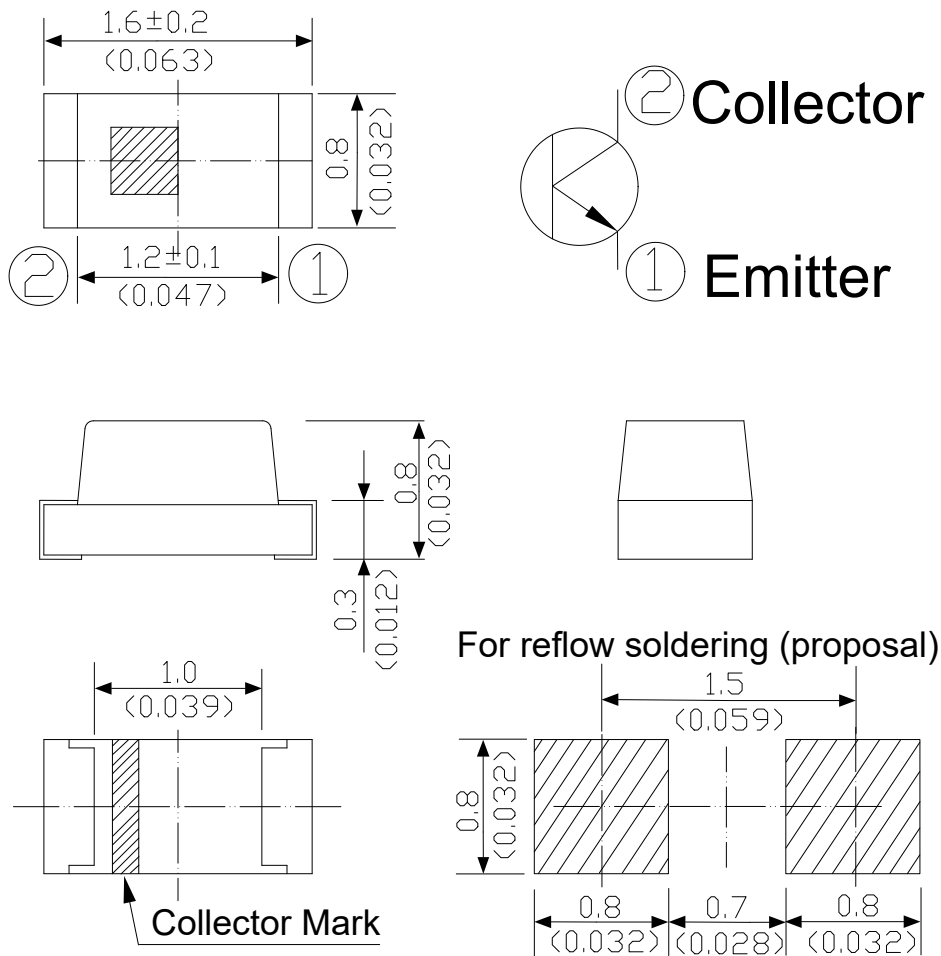
#### ■ Descriptions

PT1921B is a high speed and high sensitive NPN silicon planar phototransistor in a miniature flat top view lens SMD package. The device is spectrally matched to visible and infrared emitting diode.

#### ■ Applications

- . Infrared applied system
- . Miniature switch
- . Position sensor
- . Encoder
- . Counters and sorter

## ■ Package Dimensions



- Note: 1. All dimensions are in millimeters(inches)  
 2. Tolerances unless dimensions  $\pm 0.1\text{mm}(.004\text{'})$   
 3. Suggested pad dimension is just for reference only  
 Please modify the pad dimension based on need

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

Parameter	Symbol	Rating	Units
Collector-Emitter Voltage	$V_{\text{CEO}}$	30	V
Emitter-Collector-Voltage	$V_{\text{ECO}}$	5	V
Collector Current	$I_{\text{C}}$	20	mA
Power Dissipation at (or below) 25°C Free Air Temperature	$P_{\text{c}}$	75	mW
Lead Soldering Temperature	$T_{\text{sol}}$	260	°C
Operating Temperature	$T_{\text{opr}}$	-20 ~ +85	°C
Storage Temperature	$T_{\text{stg}}$	-40 ~ +85	°C

Notes:\*1:Soldering time  $\leq 5$  seconds.

### ■ Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
Range of Spectral Bandwidth	$\lambda_{0.5}$	---	730	--	1100	nm
Wavelength of Peak Sensitivity	$\lambda_p$	---	--	940	--	nm
Collector – Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=100\mu A$ $E_e=0mW/cm^2$	30	--	--	V
Emitter-Collector Breakdown Voltage	$BV_{ECO}$	$I_E=100\mu A$ $E_e=0mW/cm^2$	5	--	--	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=2mA$ $E_e=1mW/cm^2$	--	--	0.4	V
Rise Time	$t_r$	$V_{CE}=5V$ $I_C=1mA$	--	15	--	$\mu S$
Fall Time	$t_f$	$RL=1000\Omega$	--	15	--	$\mu S$
DC Current Amplification Factor	$H_{FE}$	$V_{CE}=5V$ , $I_C=2mA$	1000	--	1800	
Collector Dark Current	$I_{CEO}$	$E_e=0mW/cm^2$ $V_{CE}=20V$	--	--	100	nA
On State Collector Current	$I_{C(on)}$	$E_e=1mW/cm^2$ $V_{CE}=5V$	0.7	1.5	--	mA

### ■ Typical Electro-Optical Characteristics Curves

Fig.1 Collector Power Dissipation vs. Ambient Temperature

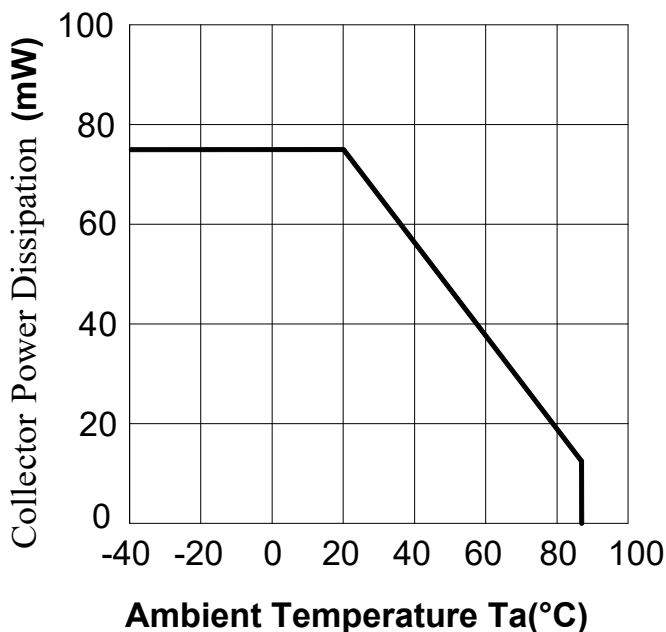


Fig.2 Spectral Sensitivity

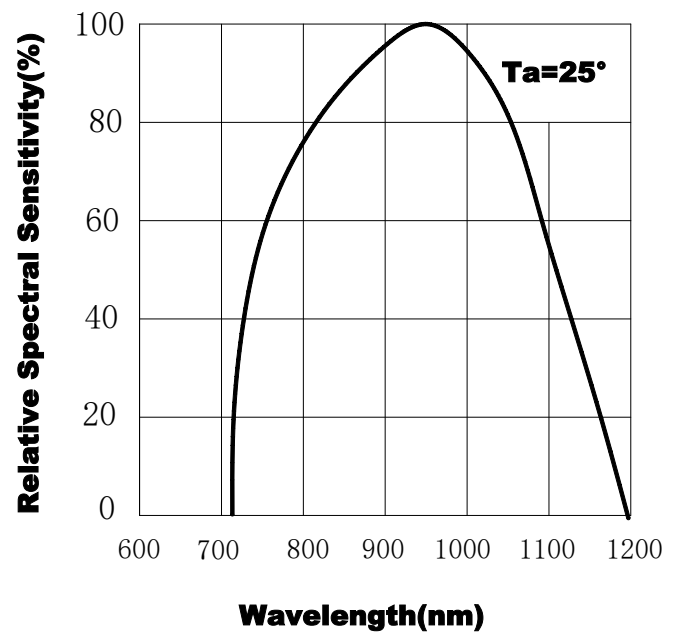


Fig.3 Relative Collector Current vs. Ambient Temperature

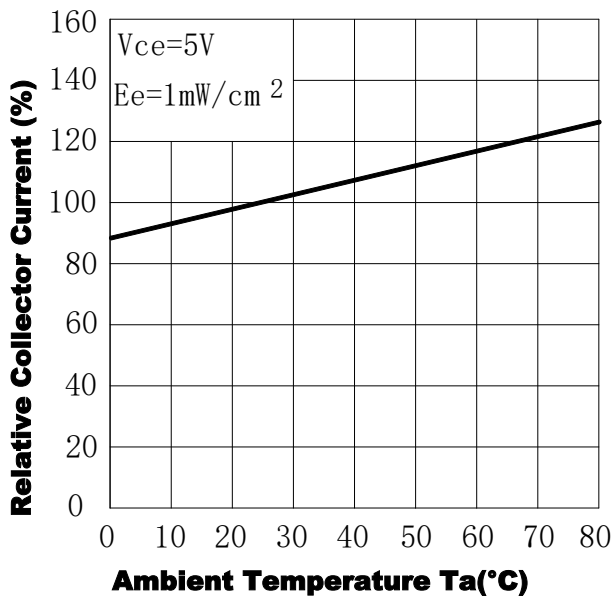


Fig.4 Collector Current vs. Irradiance

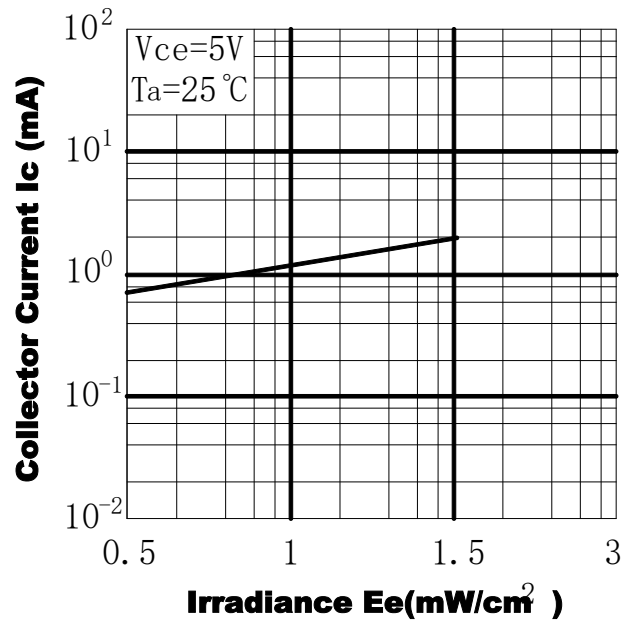


Fig.5 Collector Dark Current vs. Ambient Temperature

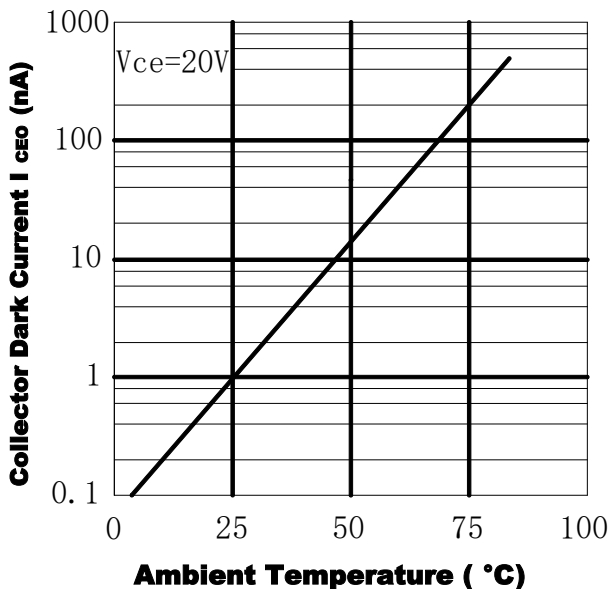
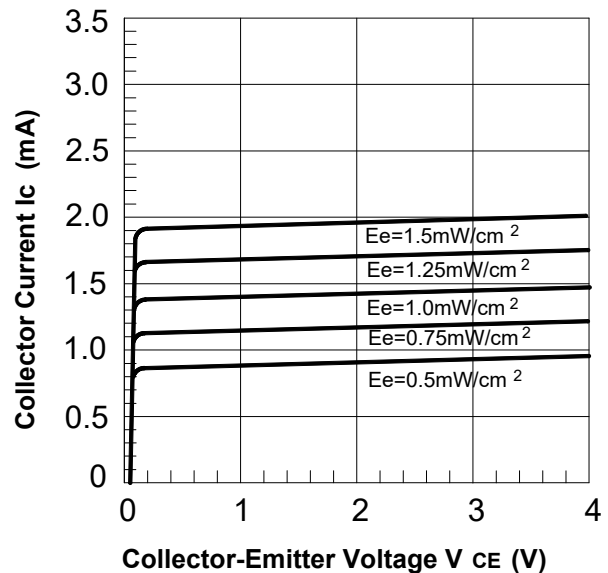


Fig.6 Collector Current vs. Collector-Emitter Voltage





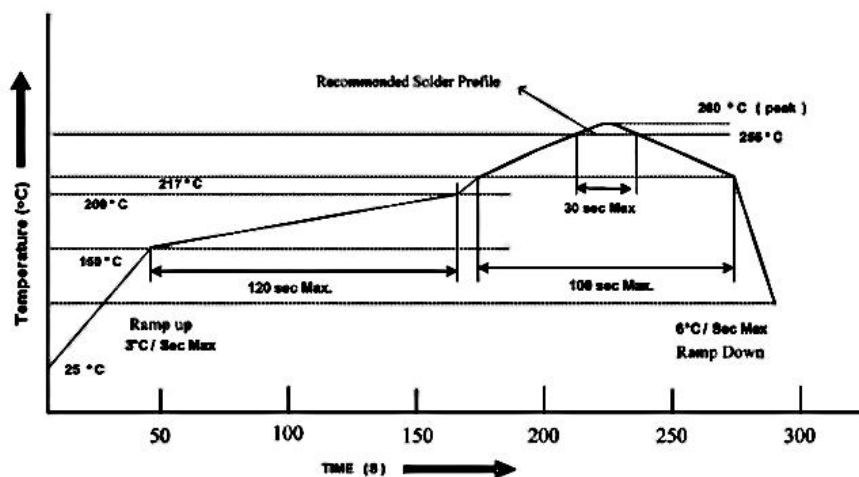
to the product caused by the use of the product beyond the limit parameters.

3. Stored at a temperature not higher than 30° C and humidity not higher than 60%RH, the product shelf life is 6 months. Keeping the product in an airtight container with a desiccant can extend the shelf life of the product to some extent. Poor storage conditions can cause corrosion of product leads or changes in product performance.
4. After opening, the product must be used within 168 hours (recommended working environment temperature not higher than 30 °C, humidity not higher than 60%). If it is not used up, the remaining material must be stored in an environment where the temperature is not higher than 30° C and the humidity is not higher than 10%.
5. For products that have not been soldered, if the hygroscopic agent or packaging fails, or the product does not meet the above valid storage conditions, baking can play a certain performance recovery effect. Baking conditions: 60±5°C, duration 96H.
6. Static electricity and surges will cause changes in product characteristics, such as forward voltage reduction, etc. If the situation is serious, it will even damage the product, so effective anti-static measures must be taken during use. All related equipment and machines should be properly grounded, and other measures against static electricity and surges must be taken. The use of anti-static wristbands, anti-static mats, anti-static work clothes, work shoes, gloves, and anti-static containers are all effective measures to prevent static electricity and surges.
7. Welding should pay special attention to:

(1) Manual soldering: the tip temperature of the soldering iron (up to 25W) should not exceed 350° C; the soldering iron must be grounded, and the static electricity should not exceed the range; the soldering time should not exceed 3 seconds.

(2) Reflow soldering

. Pb-free solder temperature profile



- . Reflow soldering should not be done more than two times.
- . When soldering, do not put stress on the photo diode during heating
- . After soldering, do not wrap the circuit board.