

## Chip Phototransistor with Spherical top view lens

### PT12-21C/TR8



#### Features

- Fast response time
- High photo sensitivity
- Small junction capacitance
- Package in 8mm tape in "7" diameter reel
- Pb free
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH
- Compliance Halogen Free .(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm).

#### Descriptions

- PT12-21C/TR8 is a phototransistor in miniature SMD package which is molded in a water clear epoxy with spherical top view lens  
The device is spectrally matched to infrared emitting diode.

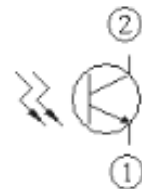
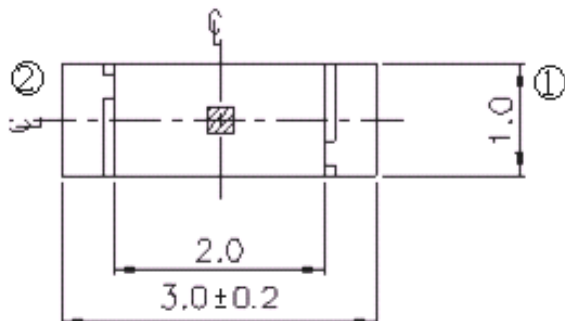
#### Applications

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

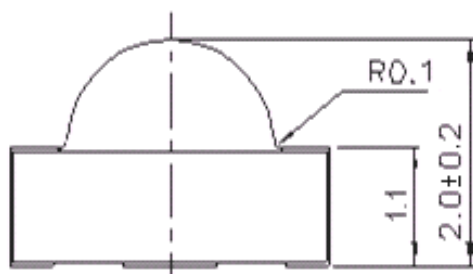
#### Device Selection Guide

Part Category	Chip Material	Lens Color
PT	Silicon	Water clear

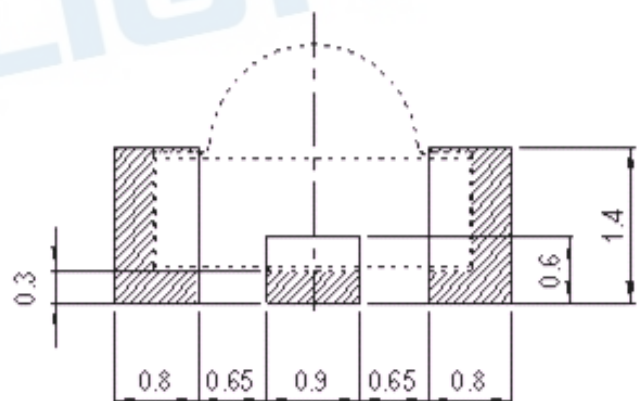
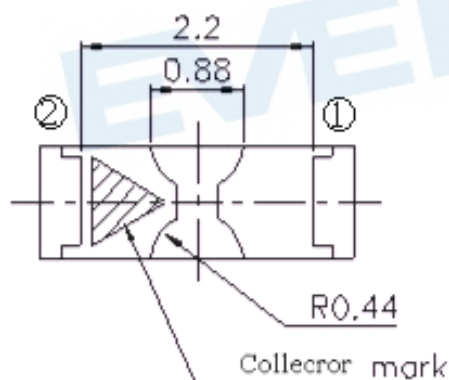
## Package Dimensions



② Collector  
① Emitter



For reflow soldering (propose)



- Notes:**
- 1.All dimensions are in millimeters
  - 2.Tolerances unless dimensions  $\pm 0.1\text{mm}$
  - 3.Suggested pad dimension is just for reference only.  
Please modify the pad dimension based on individual need.

**Absolute Maximum Ratings (Ta=25°C)**

Parameter	Symbol	Rating	Units
Collector-Emitter Voltage	V <sub>ceo</sub>	30	V
Emitter-Collector-Voltage	V <sub>eco</sub>	5	V
Collector Current	I <sub>c</sub>	50	mA
Operating Temperature	T <sub>opr</sub>	-25 ~ +85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +85	°C
Soldering Temperature	T <sub>sol</sub>	260	°C
Power Dissipation at (or below) 25°C Free Air Temperature	P <sub>c</sub>	75	mW

**Notes:** \*1: Soldering time ≤ 5 seconds.

**Electro-Optical Characteristics (Ta=25°C)**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Units
Range Of Spectral Bandwidth	$\lambda_{0.1}$	---	400	---	1100	nm
Wavelength Of Peak Sensitivity	$\lambda_p$	---	---	890	---	nm
Collector-Emitter Breakdown Voltage	BV <sub>ceo</sub>	I <sub>c</sub> =100μA Ee=0mW/cm <sup>2</sup>	30	---	---	V
Emitter-Collector Breakdown Voltage	BV <sub>eco</sub>	I <sub>e</sub> =100μA Ee=0mW/cm <sup>2</sup>	5	---	---	V
Collector-Emitter Saturation Voltage	V <sub>ce(sat)</sub>	I <sub>c</sub> =2mA Ee=1mW/cm <sup>2</sup>	---	---	0.4	V
Collector Dark Current	I <sub>ceo</sub>	V <sub>ce</sub> =20V Ee=0mW/cm <sup>2</sup>	---	---	100	nA
On State Collector Current	I <sub>c(on)</sub>	V <sub>ce</sub> =5V Ee=1mW/cm <sup>2</sup>	0.30	1.14	---	mA

## Typical Electro-Optical Characteristics Curves

Fig.1 Spectral Sensitivity

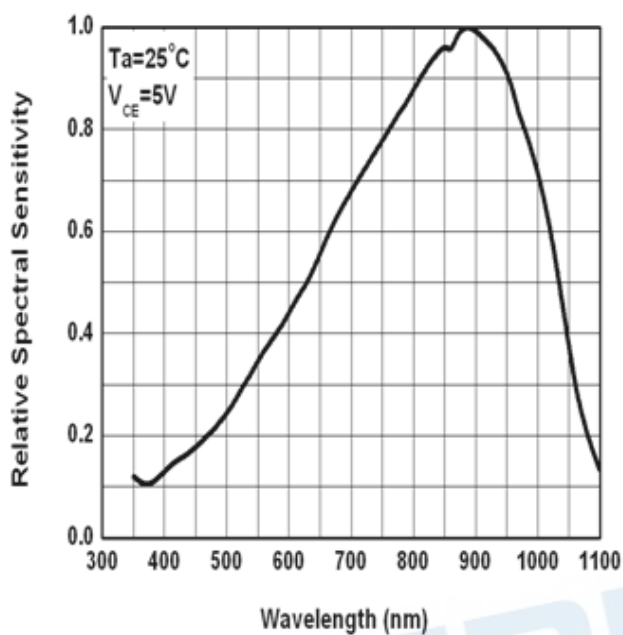


Fig.2 Collector Current vs Irradiance

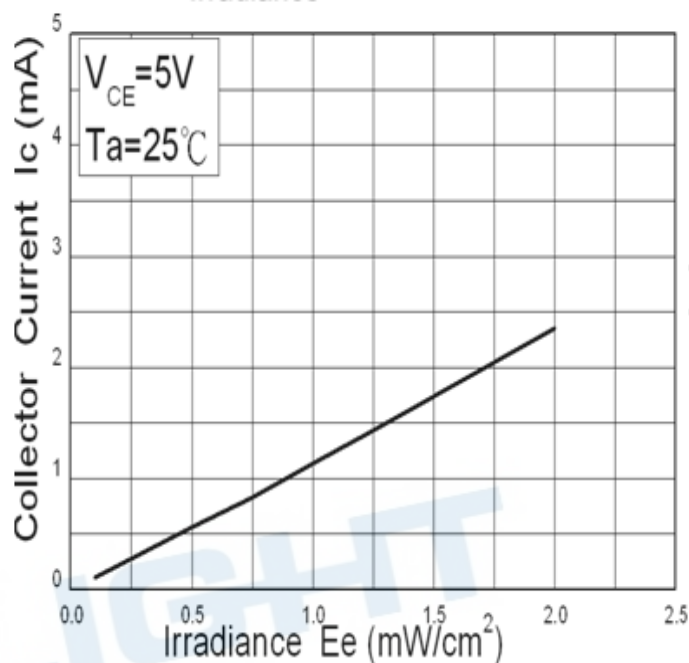
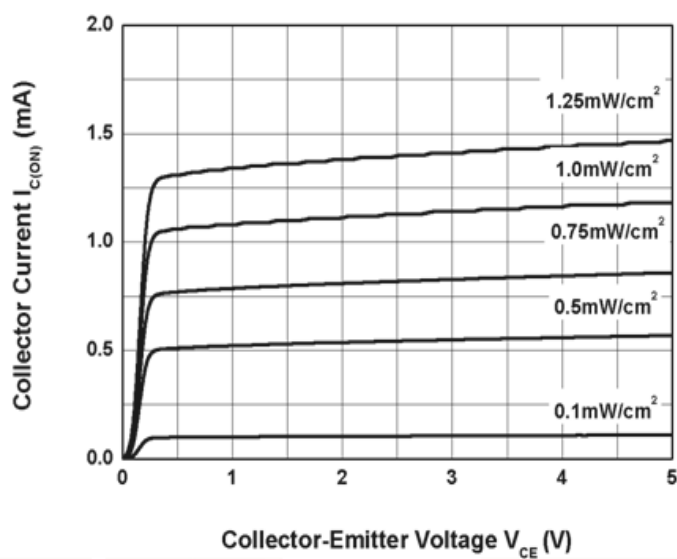


Fig.3 Collector Current vs. Collector-Emitter Voltage



## Precautions For Use

### 1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

### 2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the Phototransistor should be kept at 10°C~30°C and 90%RH or less.

2.3 The Phototransistor suggested be used within one year.

2.4 After opening the package, the devices must be stored at 10°C~30°C and  $\leq 60\%RH$ , and used within 168 hours (floor life). If unused Phototransistor remain, it should be stored in moisture proof packages.

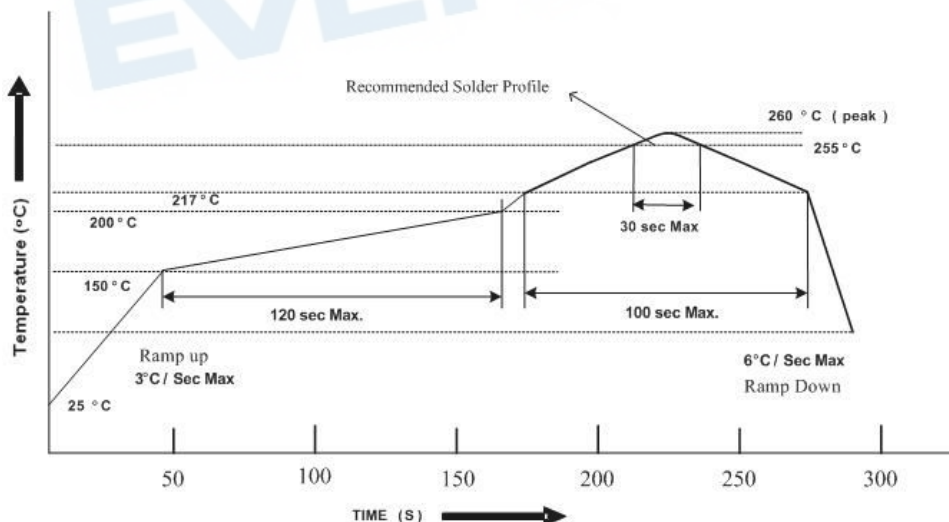
2.5 If the moisture absorbent material (desiccant material) has faded or unopened bag has exceeded the shelf life or devices (out of bag) have exceeded the floor life, baking treatment is required.

2.6 If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure or recommend the following conditions:

96 hours at 60°C  $\pm$  5°C and <5 % RH (reeled/tubed/loose units)

### 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 Phototransistor during heating.

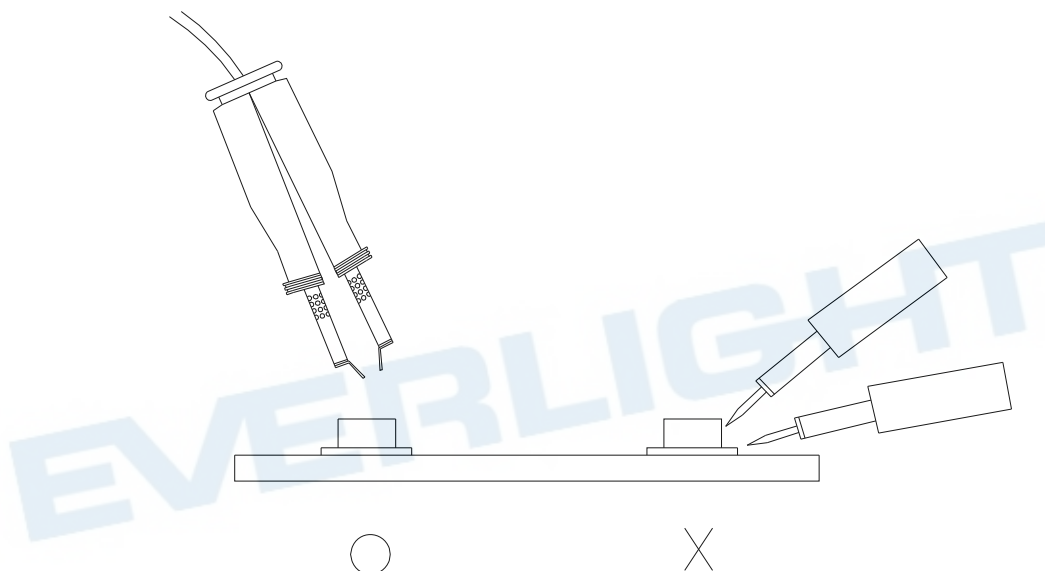
3.4 After soldering, do not warp the circuit board.

#### 4.Soldering Iron

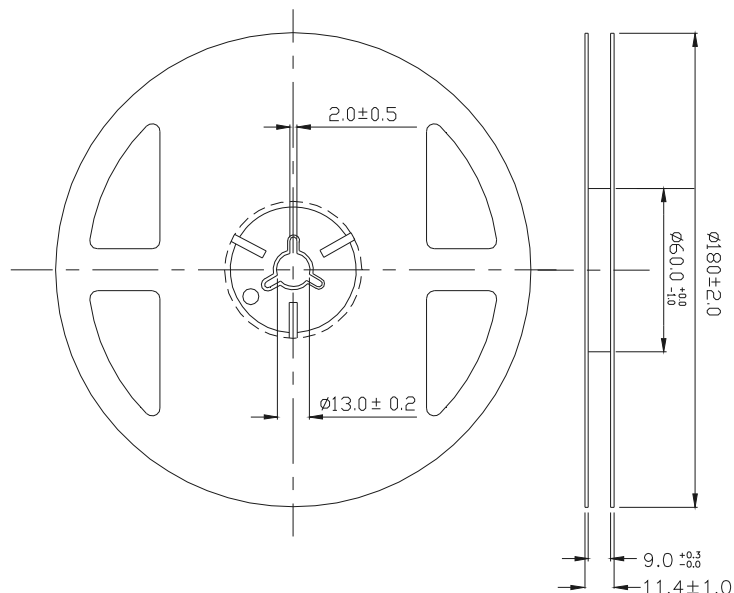
Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

#### 5.Repairing

Repair should not be done after the Phototransistor have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the Phototransistor will or will not be damaged by repairing.

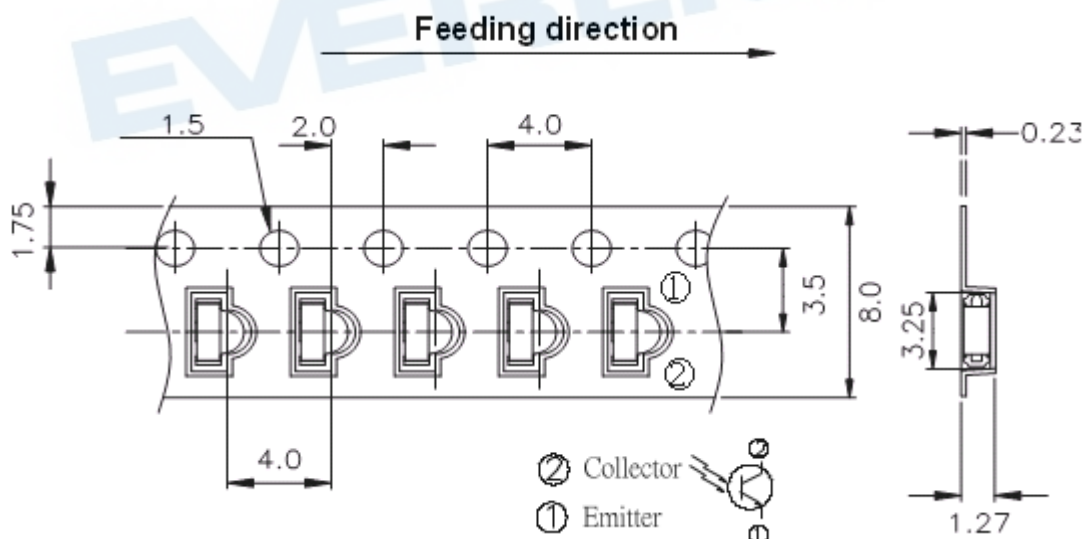


## Package Dimensions



**Note:** The tolerances unless mentioned are  $\pm 0.1$ mm, Unit: mm

**Carrier Taping Dimensions: Loaded Quantity 2000PCS/Reel**



**Note:** The tolerances unless mentioned are  $\pm 0.1$ mm, Unit: mm

## Label Form Specification

RoHS	<b>EVERLIGHT</b>	5
CPN: XXXXXXXXXXXXXXXXXXXX		
XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX		
P/N: XXXXXXXXXXXX		
XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX		
LOT NO: Y150716XXX-XXXXXXXXXX-XXXXXXXXXX		
QTY: 0123456789 HUE: XXXXXXXXXXXX		
CAT: XXXXXXXXXXXX REF: XXXXXXXXXXXX		
REFERENCE: BTPYYMDDXXXXX		
MSL-X MADE IN XXXXXXXX		

CPN: Customer's Production Number

P/N : Production Number

LOT No: Lot Number

QTY: Packing Quantity

HUE: Peak Wavelength

CAT: Ranks

REF: Reference

MSL-X: MSL Level

Made In: Manufacture place

## DISCLAIMER

1. EVERLIGHT reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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**EVERLIGHT ELECTRONICS CO., LTD.**  
Office: No. 6-8, Zhonghua Rd., Shulin Dist.,  
New Taipei City 23860, Taiwan

Tel: 886-2-2685-6688  
Fax: 886-2685-2699 · 6897  
<http://www.everlight.com>