

DATASHEET

1.9mm Round Subminiature“ Z-Bend” Lead Phototransistor PT91-21C/TR10



Features

- .Fast response time
- .High photo sensitivity
- .Small junction capacitance
- .Compatible with infrared and vapor phase reflow solder process.
- .Pb free
- .RoHS Compliance
- .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)

Description

- .PT91-21C/TR10 is a phototransistor in miniature SMD package which is molded in water clear plastic with spherical top view lens.
- .The device is spectrally matched to infrared emitting diode.

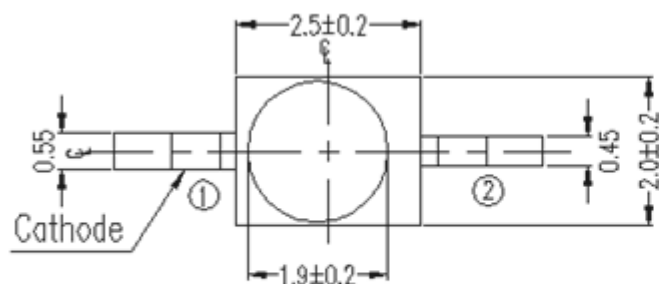
Applications

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

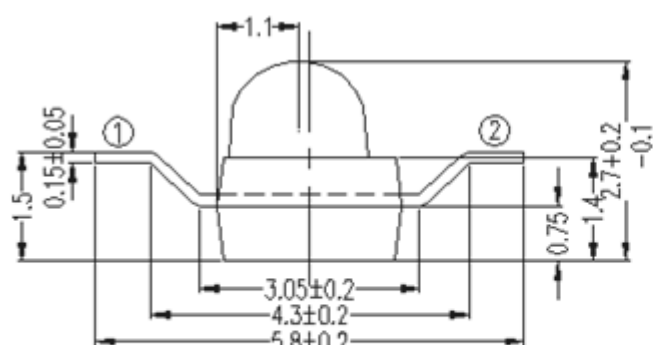
Device Selection Guide

Device No.	Chip Material	Lens Color
PT91-21C/TR10	Silicon	Water clear

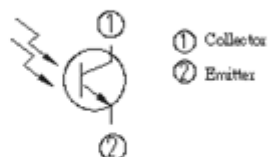
Package Dimensions



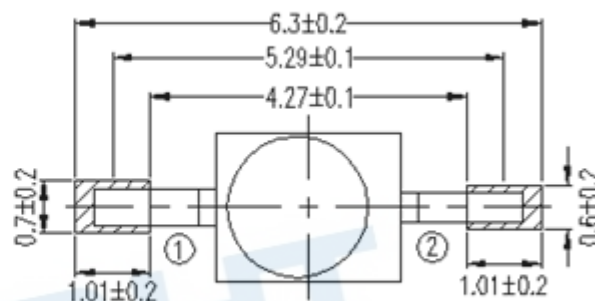
Top



Side



Recommend Soldering Pad



- Notes:** 1.All dimensions are in millimeters
2.Tolerances unless dimensions ± 0.1 mm

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Units
Collector Emitter Voltage	V _{CEO}	30	V
Emitter Collector Voltage	V _{ECO}	5	V
Collector Current	I _C	20	mA
Operating Temperature	T _{opr}	-25 ~ +85	°C
Storage Temperature	T _{stg}	-40 ~ +100	°C
Soldering Temperature *1	T _{sol}	260	°C
Power Dissipation at (or below) 25°C Free Air Temperature	P _c	75	mW

Notes: *1:Soldering time ≤ 5 seconds.

Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Units	Condition
Rang of Spectral Bandwidth	λ _{0.5}	400	---	1100	nm	---
Wavelength of Peak Sensitivity	λ _P	---	940	---	nm	---
Collector Emitter Breakdown Voltage	BV _{CEO}	30	---	---	V	I _C =100μA Ee=0mW/cm ²
Emitter Collector Breakdown Voltage	BV _{ECO}	5	---	---	V	I _E =100μA Ee=0mW/cm ²
Collecto Emitter Saturation Voltage	V _{CE(sat)}	---	---	0.4	V	I _C =2mA Ee=1m W/cm ²
Collector Dark Current	I _{CEO}	---	---	100	nA	V _{CE} =20V Ee=0mW/cm ²
On State Collector Current	I _{C(ON)}	1.0	1.5	---	mA	V _{CE} =5V Ee=1mW /cm ²
Rise Time	t _r	---	15	---	μS	V _{CE} =5V I _C =1mA R _L =1000Ω
Fall Time	t _f	---	15	---		

Typical Electrical/Optical/Characteristics Curves

Fig.1 Collector Power Dissipation vs. Ambient Temperature

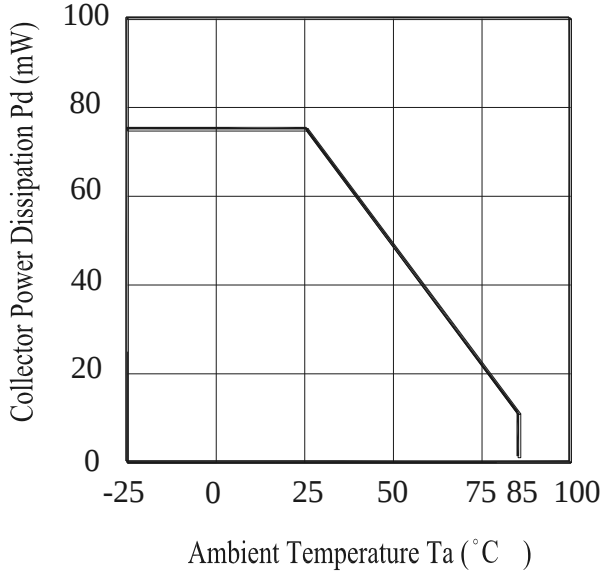


Fig.2 Spectral Sensitivity

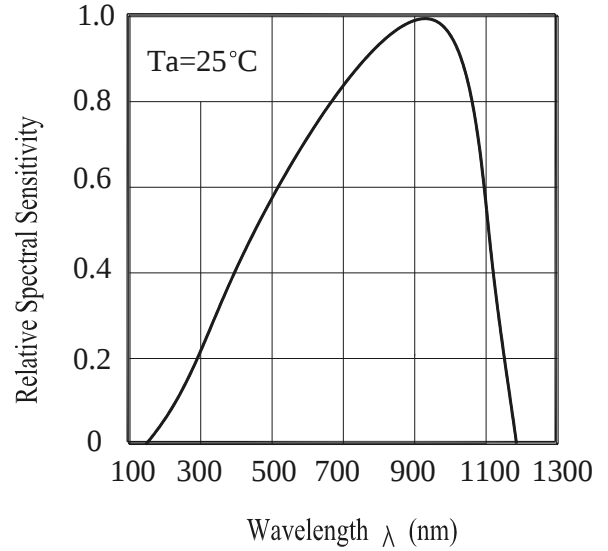


Fig.3 Relative Collector Current vs. Ambient Temperature

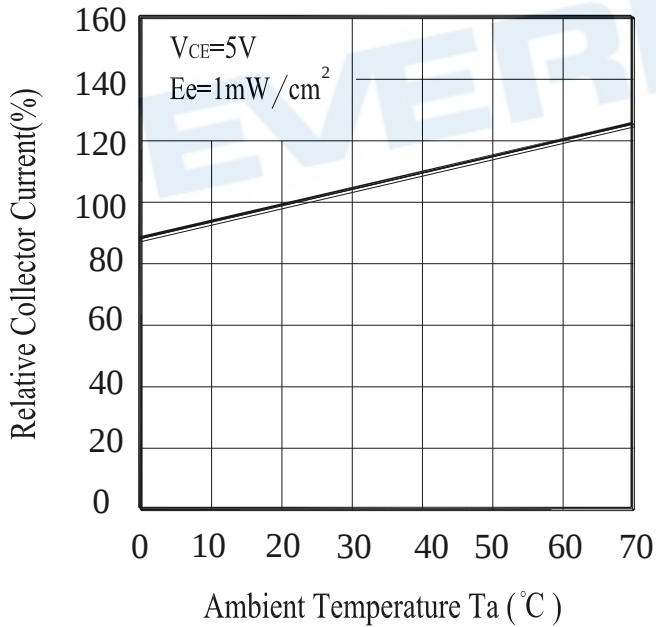
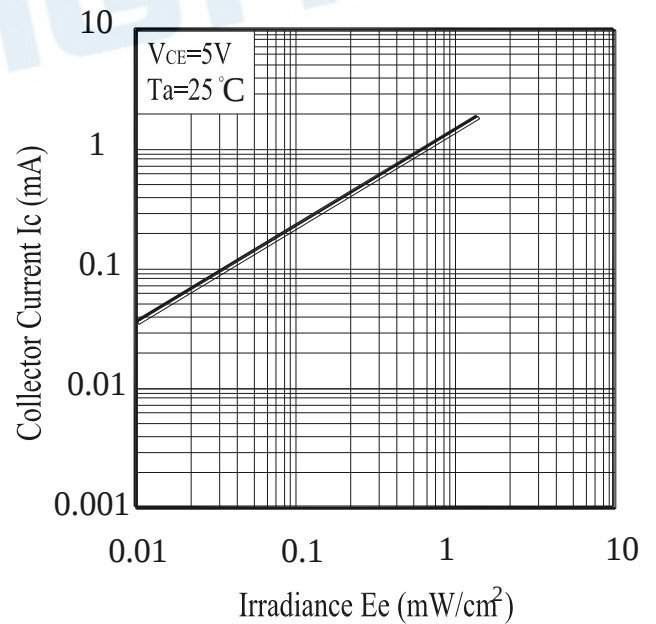


Fig.4 Collector Current vs. Irradiance



Typical Electro-Optical Characteristics Curves

Fig.5 Collector Dark Current vs.
Ambient Temperature

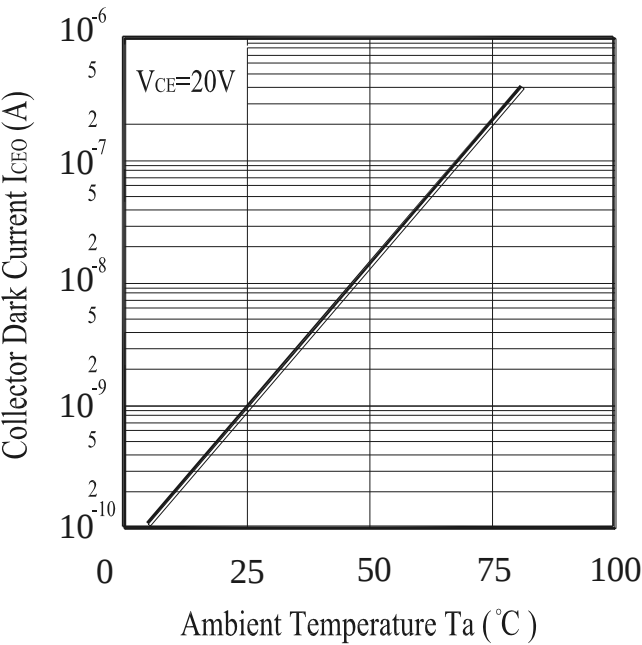
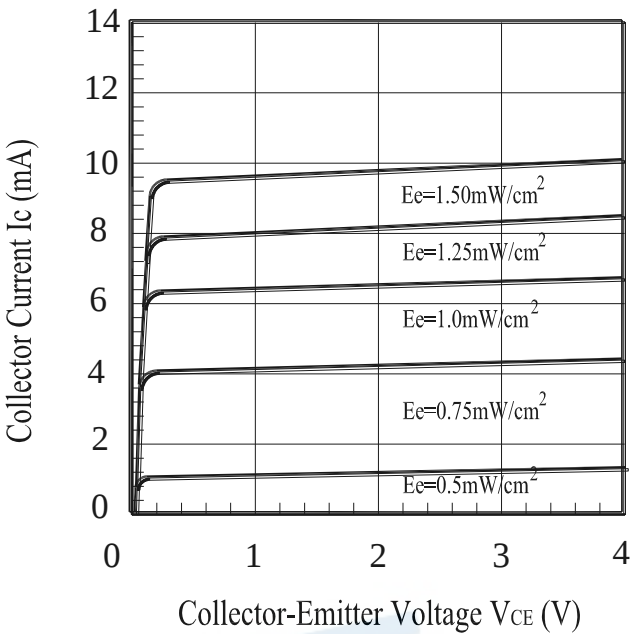


Fig.6 Collector Current vs.
Collector-Emitter Voltage



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.

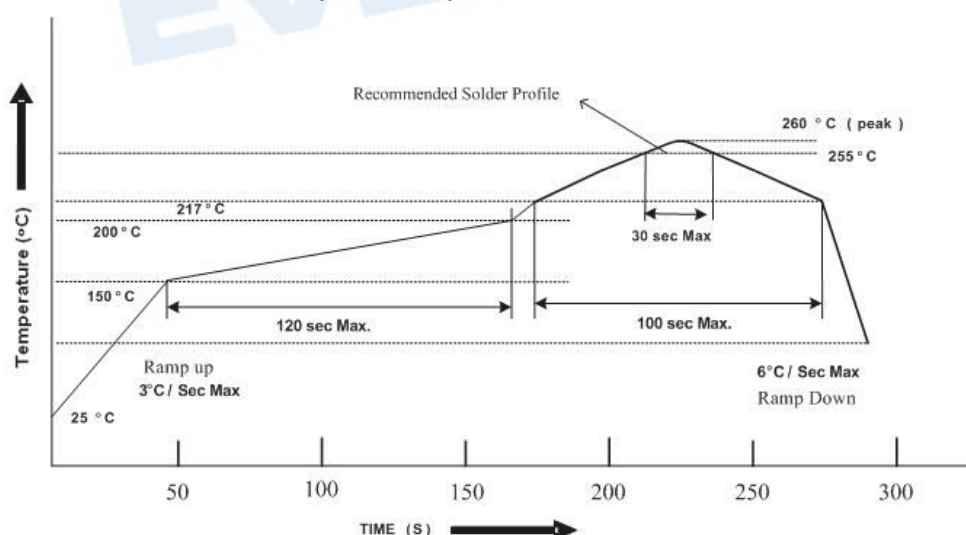
2.5 If the moisture absorbent material (desiccant material) has faded or unopened bag has exceeded the shelf life or devices (out of bag) have exceeded the floor life, baking treatment is required.

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.

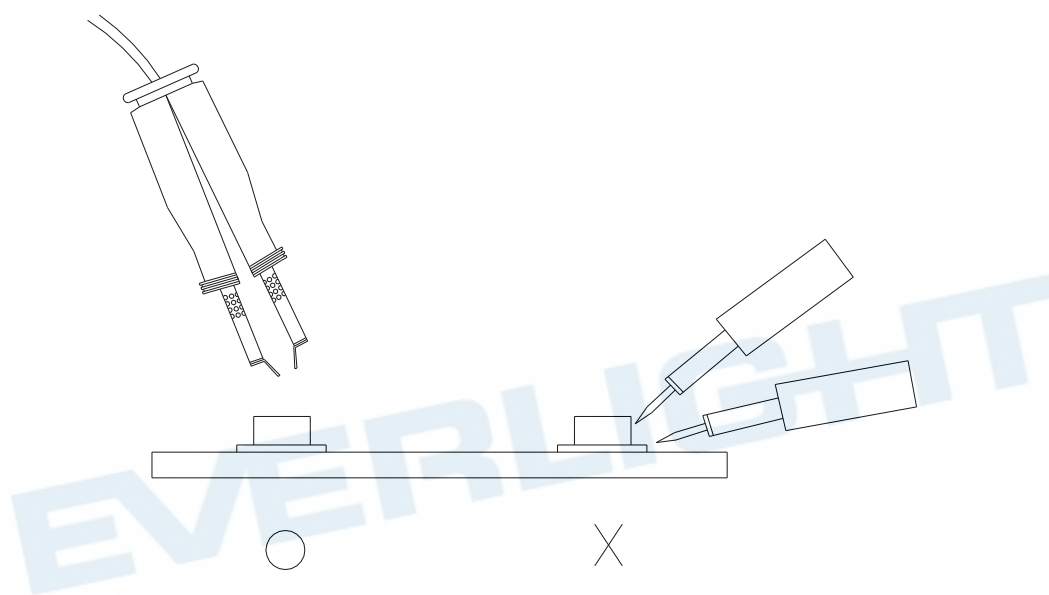
3.4 After soldering, do not warp the circuit board.

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.



Technical drawing of a circular mechanical part, showing a top view and a side view.

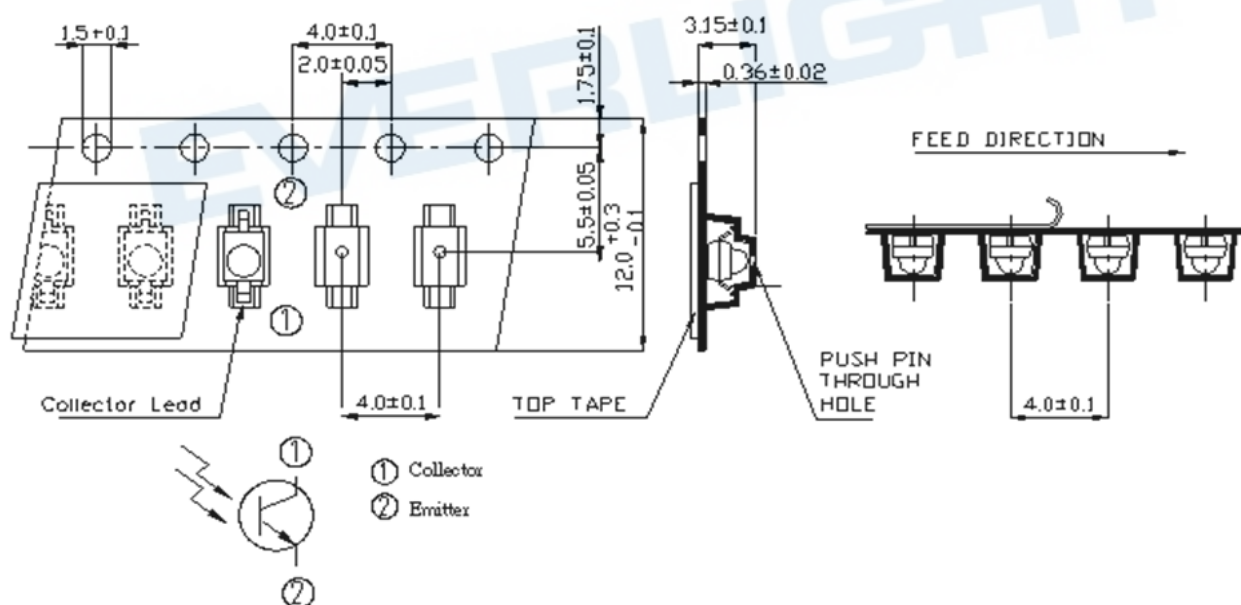
Top View Dimensions:

- Overall diameter: $\phi 178.0 \pm 1.0$
- Inner circular feature diameter: $\phi 13.0 \pm 0.5$
- Distance from center to the inner feature: 2.5 ± 0.5
- Four triangular cutouts are present, each with a base of 13.2 ± 1.0 and a height of 16.0 ± 1.0 .

Side View Dimensions:

- Overall thickness: 178.0 ± 1.0
- Inner feature thickness: 60.2 ± 1.0

Carrier Taping Dimensions: (Quantity: 1000PCS/Reel)



Note: The tolerances unless mentioned are ± 0.1 , Unit: mm.

Label Form Specification



CPN: Customer's Production Number

P/N : Production Number

QTY: Packing Quantity

CAT: Ranks

HUE: Peak Wavelength

REF: Reference

LOT No: Lot Number

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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