Top Phototransistor

MODEL NO : PT42-21B/TR8

Features :

- Fast response time
- High photo sensitivity
- Small junction capacitance
- High reliability

Description :

- PT42-21B/TR8 is a high speed silicon NPN epitaxial planar phototransistor in a compact surface-mountable package. It’s compatible with automatic placement equipment and can withstand IR reflow, vapor phase reflow, and wave solder processes.

Applications :

- Miniature switch
- Counters and sorter
- Interrupter
- Position sensor

PART NO.	CHIP MATERIAL	LENS COLOR
PT	Silicon	Black

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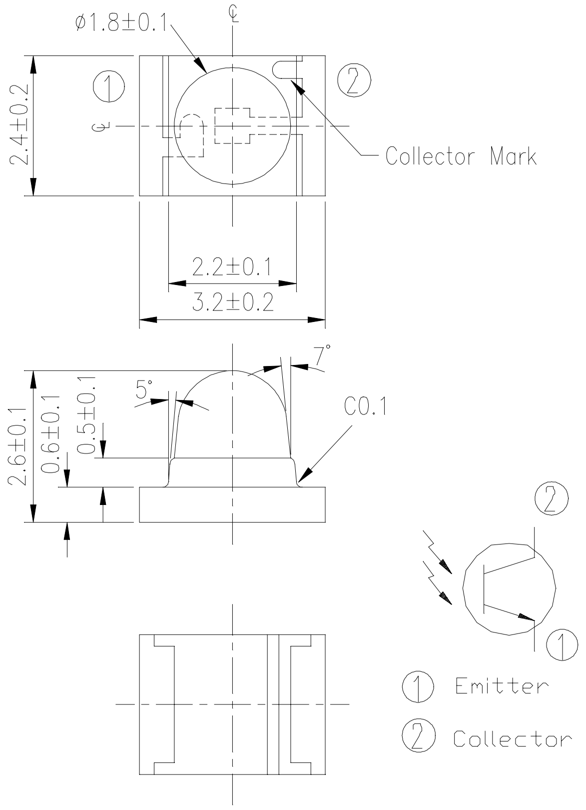
Package Dimensions :



Notes :

1.All dimensions are in millimeter.

2.General Tolerance: ± 0.1mm

3.Lens color：Black transparent.

4.Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.

5.These specification sheets include materials protected under copyright of EVERLIGHT corporation . Please don’t reproduce or cause anyone to reproduce them without EVERLIGHT’s consent.

6.When using this product , please observe the absolute maximum ratings and the instructions for use outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from 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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■ Absolute Maximum Ratings at T_A = 25℃

Parameter	Symbol	Rating	Unit	Notice
Collector-Emitter Voltage	V_{CEO}	30	V	
Emitter-Collector-Voltage	V_{ECO}	5	V	
Collector Current	I_C	20	mA	
Operating Temperature	Topr	-25 ~ +85	℃	
Storage Temperature	Tstg	-40 ~ +85	℃	
Lead Soldering Temperature	Tsol	260	℃	
Power Dissipation at(or below) 25℃ Free Air Temperature	Pc	75	mW	

■ Electronic Optical Characteristics :

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Collector-Emitter Breakdown Voltage	BV_{CEO}	30	----	----	V	Ic=100μA Ee=0mW/cm^2
Emitter-Collector Breakdown Voltage	BV_{ECO}	5	----	----	V	I_E=100μA Ee=0mW/c㎡
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	----	----	0.4	V	I_C=2mA Ee=1mW/c㎡
Rise Time	t_r	----	15	----	μS	V_{CE}=5V I_C=1mA R_L=1000Ω
Fall Time	t_f	----	15	----		
Collector Dark Current	I_{CEO}	----	----	100	nA	E_e=0mW/c㎡ V_{CE}=20V
On State Collector Current	$I_{C(on)}$	1.5	2.0	----	mA	E_e=1mW/c㎡ V_{CE}=5V
Wavelength of Peak Sensitivity	λ_P	----	980	----	nm	----
Rang of Spectrial Bandwith	$\lambda_{0.5}$	----	730--- 1200	----	nm	----

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■ Typical Electrical/Optical/Characteristics Curves：

Fig.1 Collector Power Dissipation vs. Ambient Temperature

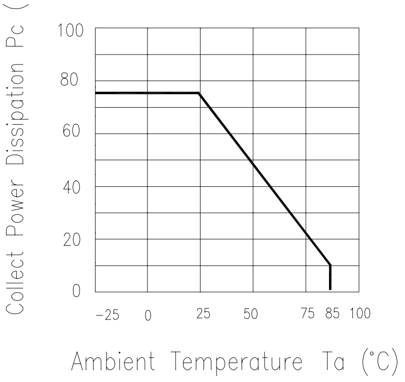


Fig.2 Collector Dark Current vs. Ambient Temperature

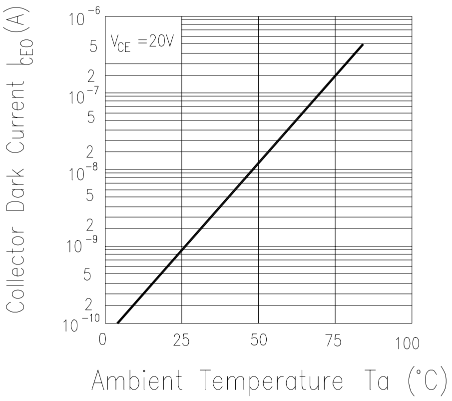


Fig. 3 Relative Collector Current vs. Ambient Temperature

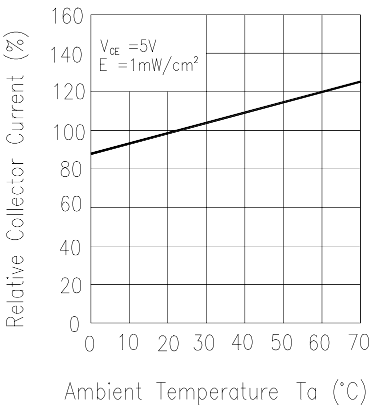


Fig.4 Collector Current vs. Irradiance

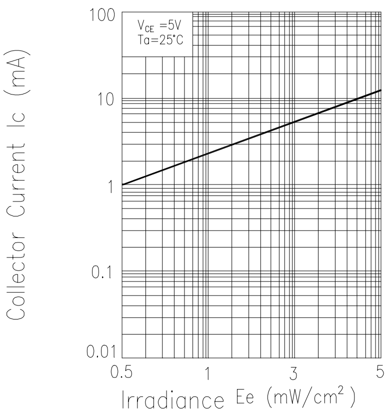


Fig.5 Spectral Sensitivity

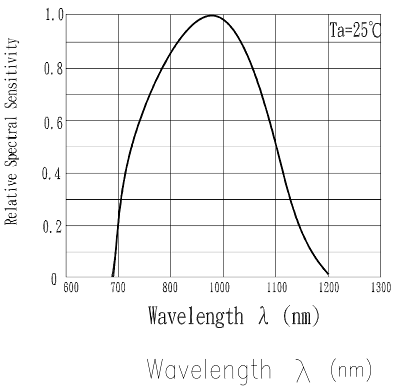
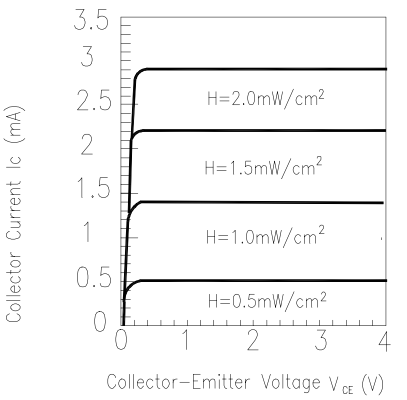


Fig.6 Collector Current vs. Collector-Emitter Voltage



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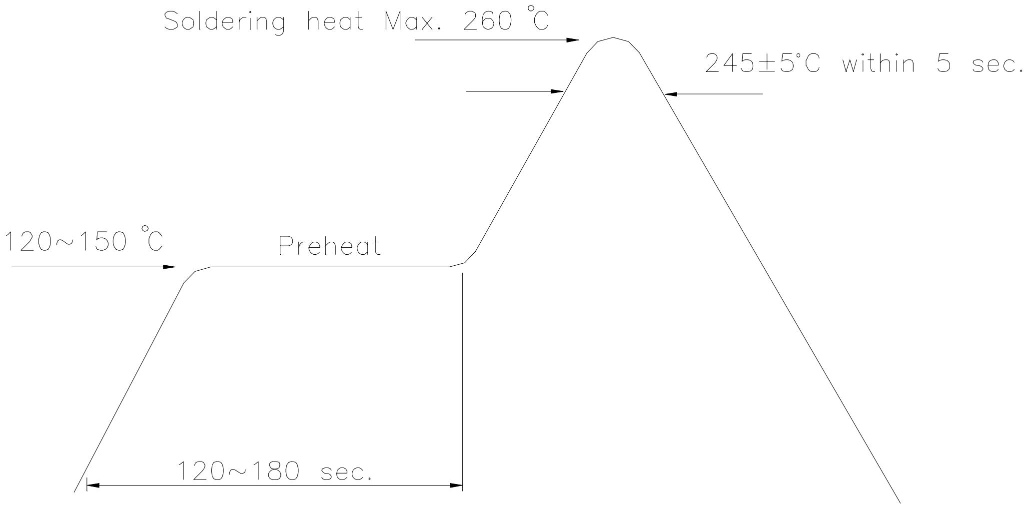
■ Reliability Test Item And Condition

The reliability of products shall be satisfied with items listed below.
Confidence level:90%
LTPD:10%

NO.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgement Criteria	Ac/Re
1	**REFLOW**	TEMP : 240℃ ± 5 ℃ 5 secs	6 mins	22 pcs	$I_{C(on)}$ ≦ L× 0.8 L:Lower specification limit	0/1
2	**Temperature Cycle**	H : +85℃ 30 mins ↕ 5 mins L : -55℃ 30 mins	50 cycles	22 pcs		0/1
3	**Thermal Shock**	H : +100℃ 5 mins ↕ 10 secs L : -10℃ 5 mins	50 cycles	22 pcs		0/1
4	**High Temperature Storage**	TEMP. : +100℃	1000 hrs	22 pcs		0/1
5	**Low Temperature Storage**	TEMP. : -55℃	1000 hrs	22 pcs		0/1
6	**DC Operating Life**	V_{CE}=5V	1000 hrs	22 pcs		0/1
7	**High Temperature / High Humidity**	85℃ / 85% R.H.	1000 hrs	22 pcs		0/1

■ Soldering heat reliability (DIP) :

Please refer to the following figure :

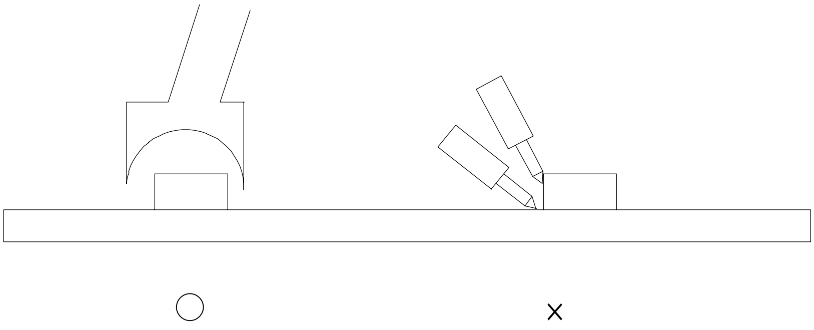


■ Soldering Iron :

Basic spec is ≦5 sec when 260℃.If temperature is higher, time should be shorter (+10℃ → -1sec). Power dissipation of Iron should be smaller than 15 W , and temperature should be controllable. Surface temperature of the device should be under 230 ℃.

■ Rework :

1. Customer must finish rework within 5 sec under 245℃.
2. The head of iron can not touch copper foil.
3. Twin-head type is preferred.



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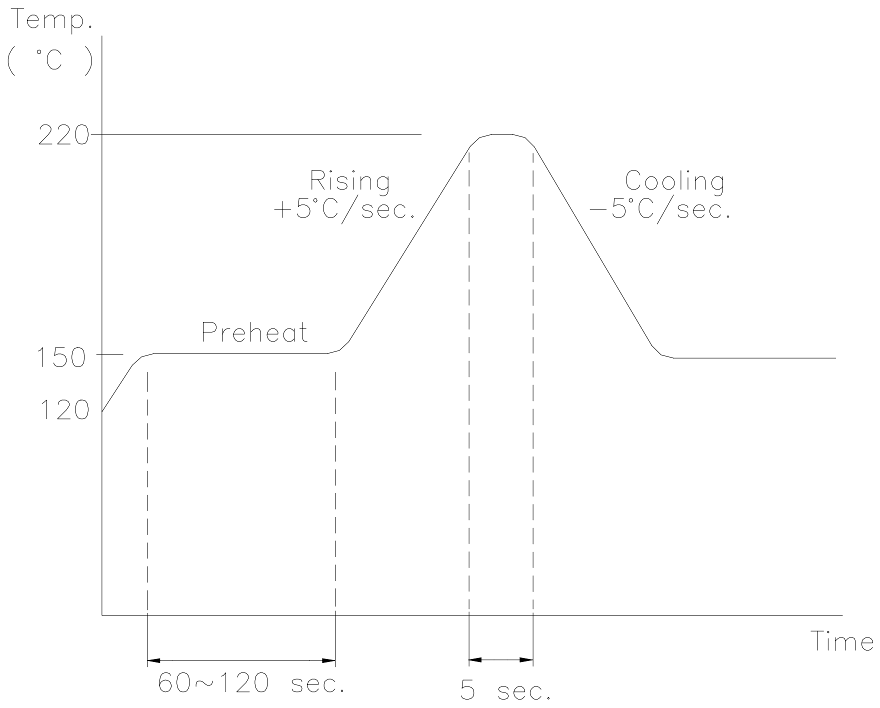
■ Reflow Temp. / Time :

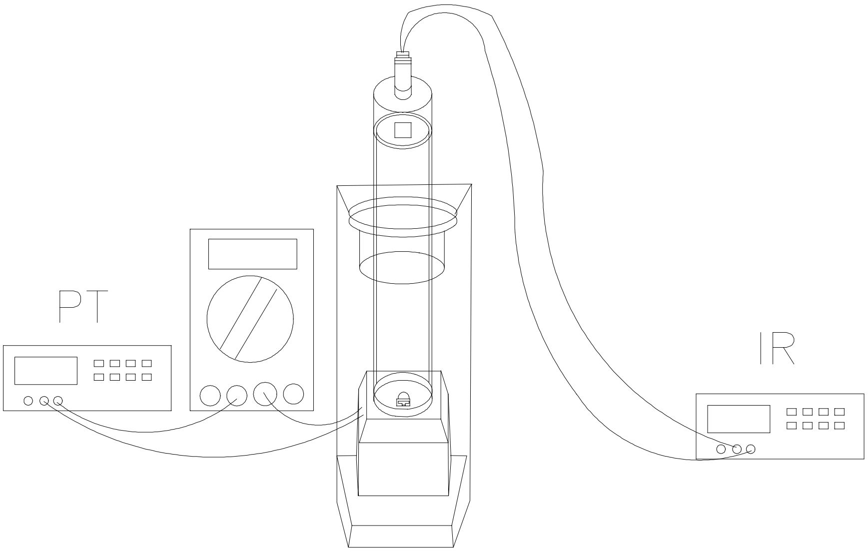


■ Test Method For Reverse Light Current

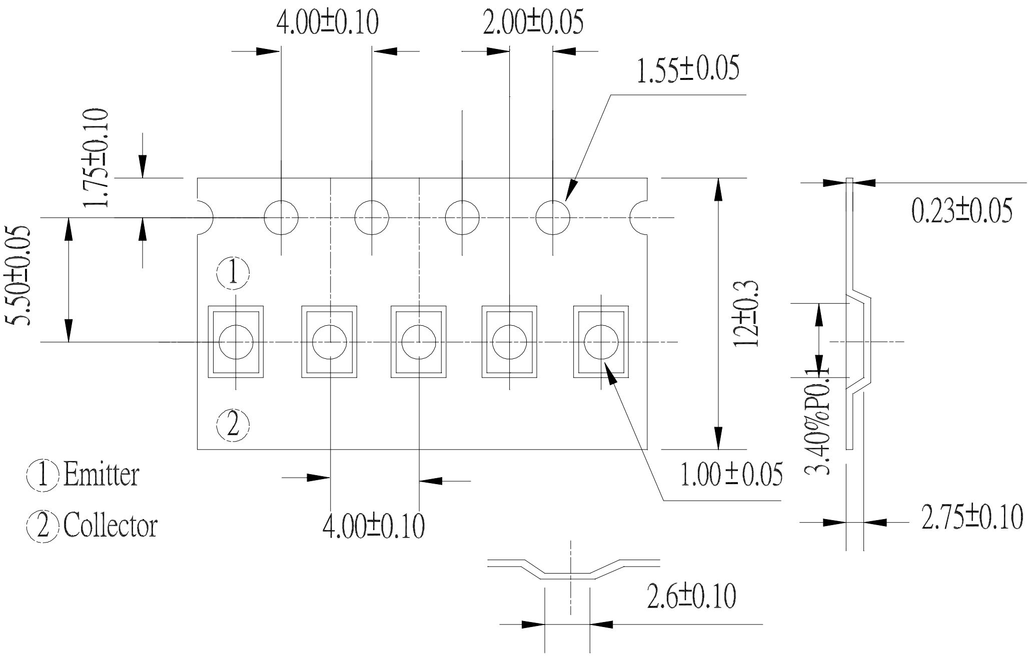
Condition: Ee=1mW/c㎡,V_{CE}=5V

Test Item: Collector Current [$I_{C(on)}$]

(Unit:mA)



■ Package Dimensions:



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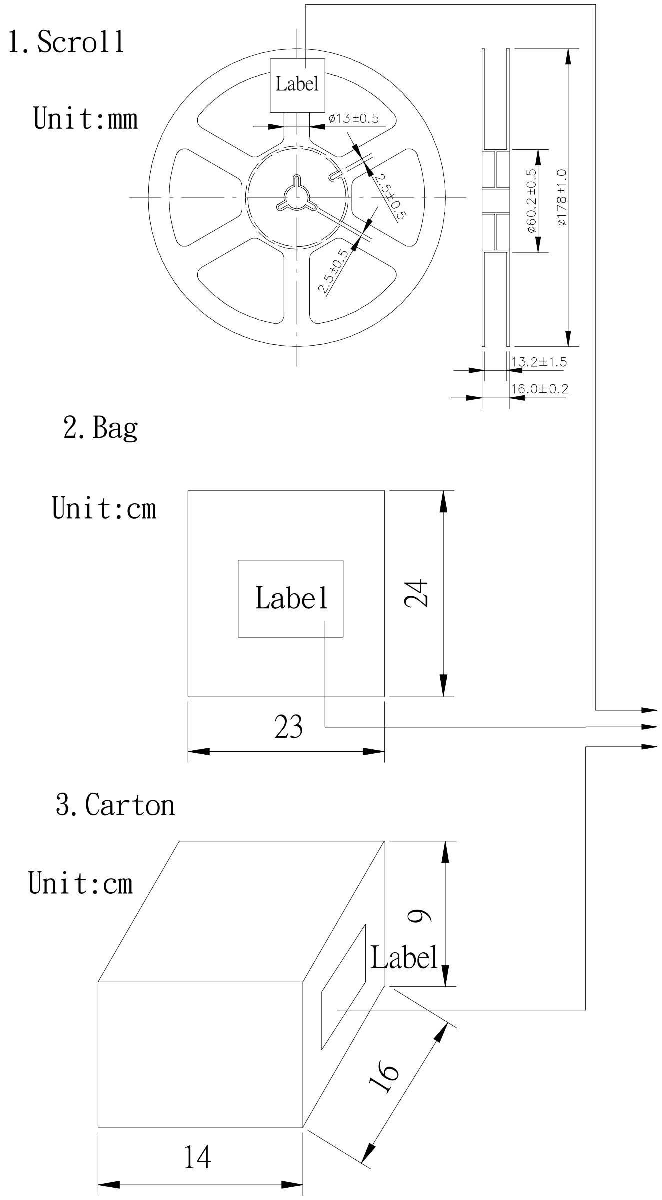
Packing Specifications



CPN：Customer's Production Number
P/N ：Production Number
QTY：Packing Quantity
CAT：Ranks
HUE：Peak Wavelength
REF : Reference
LOT NO : Lot Number
MADE IN TAIWAN：Production place

Packing Quantity Specification

1.1000 Pcs/1Volume，1Volume/1Bag
2.55Bags/1Carton