



EVERLIGHT ELECTRONICS CO., LTD.

Device Number: DPT-015-052

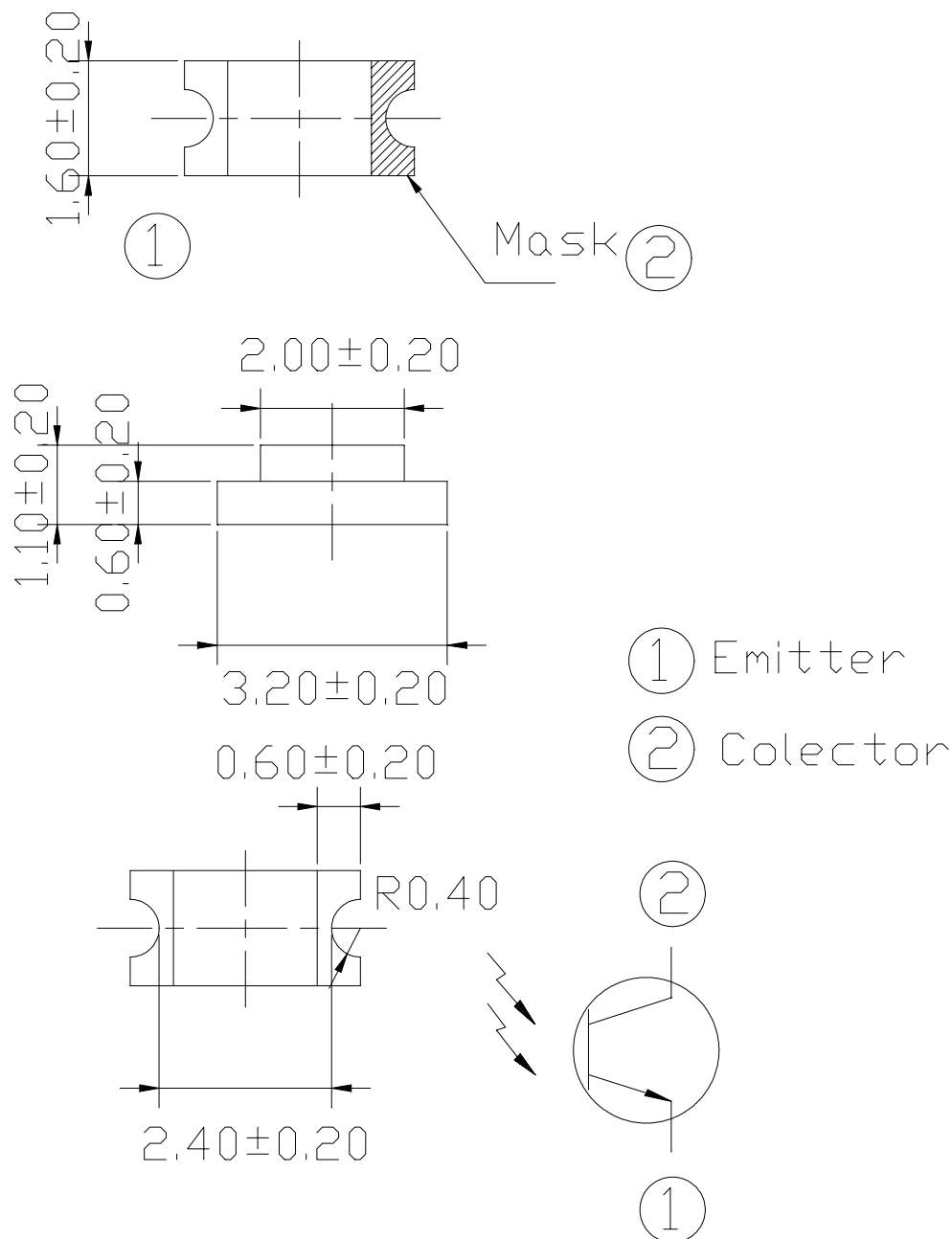
REV: 1.2

MODEL NO: PT15-21B

ECN:                     

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### Package Dimensions:



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<http://www.everlight.com>



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### ◎Notes :

- 1.All dimensions are in millimeter.
- 2.General Tolerance:  $\pm 0.25\text{mm}$
- 3.Lead spacing is measured where the lead emerge from the package.
- 4.Lens color : Black transparent
- 5.Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
- 6.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.
- 7.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.

### Description

PT15-21B is a phototransistor in miniature SMD package which is molded in a black plastic with flat top view lens. The device is spectrally matched to infrared emitting diode.

### Features

- High photo sensitivity
- Fast response time

### Applications

- Optoelectronic switch
- VCR ,Video ,Camera
- Floppy disk drive



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## Absolute Maximum Ratings

(Ta=25°C)

| Parameter                                                      | Symbol    | Rating     | Unit |
|----------------------------------------------------------------|-----------|------------|------|
| Collector-Emitter Voltage                                      | $V_{CEO}$ | 30         | V    |
| Emitter-Collector Voltage                                      | $V_{ECO}$ | 5          | V    |
| Collector Current                                              | $I_C$     | 20         | mA   |
| Operating Temperature Range                                    | $T_{opr}$ | -25 to +85 | °C   |
| Storage Temperature Range                                      | $T_{stg}$ | -45 to +85 | °C   |
| Lead Soldering Temperature<br>(1/16 inch from body for 5 sec.) | $T_{sol}$ | 260        | °C   |
| Power Dissipation at (or below) 25°C<br>Free Air Temperature   | $P_C$     | 75         | mW   |

## Electro Optical Characteristics

(Ta=25°C)

| Parameter                            | Symbol          | MIN | TYP      | MAX | Unit    | Condition                                    |
|--------------------------------------|-----------------|-----|----------|-----|---------|----------------------------------------------|
| Collector-Emitter Breakdown Voltage  | $BV_{CEO}$      | 30  |          |     | V       | $I_C=100\mu A$<br>$E_e=0mW/cm^2$             |
| Emitter-Collector Breakdown Voltage  | $BV_{ECO}$      | 5   |          |     | V       | $I_E=100\mu A$<br>$E_e=0mW/cm^2$             |
| Collector-Emitter Saturation Voltage | $V_{CE(s)}$     |     |          | 0.4 | V       | $I_C=2mA$<br>$I_B=100\mu A$                  |
| Rise Time                            | $t_R$           |     | 15       |     | $\mu S$ | $V_{CE}=5V$<br>$I_C=1mA$<br>$R_L=1000\Omega$ |
| Fall Time                            | $t_F$           |     | 15       |     |         |                                              |
| Collector Dark Current               | $I_{CEO}$       |     |          | 100 | nA      | $V_{CE}=20V$<br>$E_e=0mW/cm^2$               |
| On State Collector Current           | $I_{C(on)}$     | 0.1 | 0.3      |     | mA      | $V_{CE}=5V$<br>$E_e=1mW/cm^2$                |
| Wavelength of Peak Sensitivity       | $\lambda_p$     |     | 980      |     | nm      | -----                                        |
| Rang of Spectral Bandwidth           | $\lambda_{0.5}$ |     | 770-1200 |     | nm      | -----                                        |



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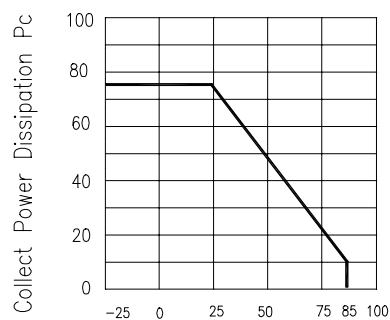
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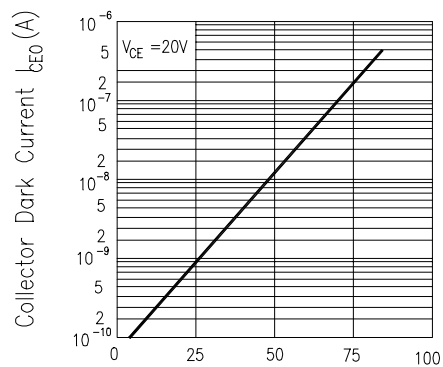
## Typical Electrical/Optical/Characteristics Curves

Fig.1 Collector Power Dissipation vs. Ambient Temperature



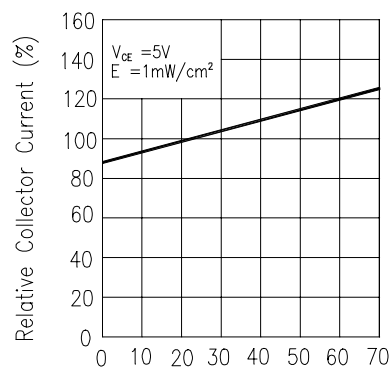
Ambient Temperature  $T_a$  (°C)

Fig.2 Collector Dark Current vs. Ambient Temperature



Ambient Temperature  $T_a$  (°C)

Fig. 3 Relative Collector Current vs. Ambient Temperature



Ambient Temperature  $T_a$  (°C)

Fig.4 Collector Current vs. Irradiance

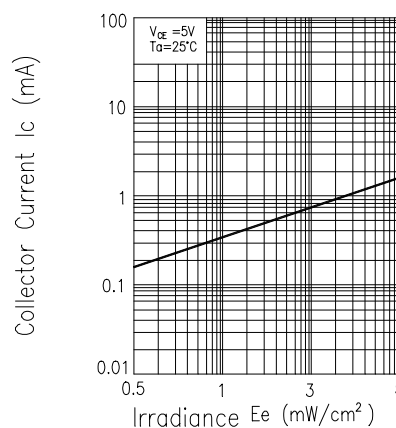


Fig.6 Collector Current vs. Collector-Emitter Voltage

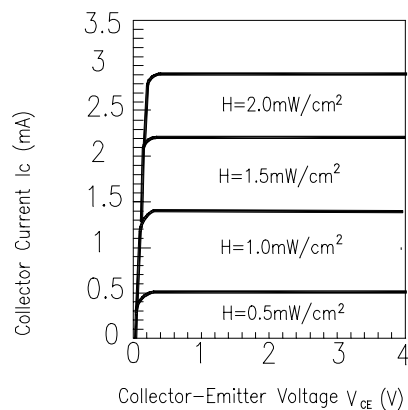
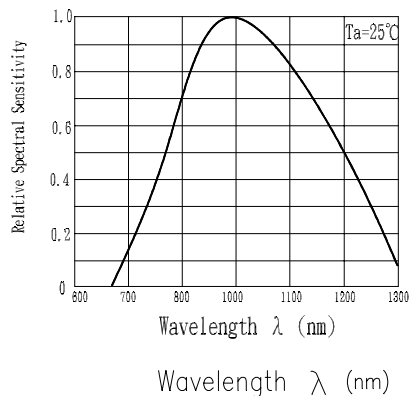


Fig.5 Spectral Sensitivity



Wavelength  $\lambda$  (nm)



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## Reliability

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

| Test Items                     | Test Conditions                                                                                       | Failure Judgement Criteria                                                  | Samples(n)<br>Defective(c) |
|--------------------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------|
| Operation life                 | $V_{CE}=5V$ , $T_a : 25^{\circ}C$ 1000hrs                                                             | $I_{C(on)} \leq L \times 0.8$<br><br>$L : \text{Lower specification limit}$ | n =22 , c=0                |
| Temperature cycle              | 1 cycle $-55^{\circ}C$ to $+25^{\circ}C$ to $+85^{\circ}C$<br>(30min) (5min) (30min)<br>50 cycle test |                                                                             | n =22 , c=0                |
| Thermal shock                  | $-10^{\circ}C$ to $+100^{\circ}C$<br>(5min) (10sec) (5min)<br>50cycle test                            |                                                                             | n =22 , c=0                |
| High temperature storage       | Temp : $+100^{\circ}C$ 1000hrs                                                                        |                                                                             | n =22 , c=0                |
| Low temperature storage        | Temp : $-55^{\circ}C$ 1000hrs                                                                         |                                                                             | n =22 , c=0                |
| High temperature High humidity | $T_a : 85^{\circ}C$ RH : 85% 1000hrs                                                                  |                                                                             | n =22 , c=0                |
| Solder heat                    | Temp : $260 \pm 5^{\circ}C$ 5sec<br>4mm Form the bottom of the package.                               |                                                                             | n =22 , c=0                |
| Solderability                  | Temp : $230 \pm 5^{\circ}C$ 5sec<br>4mm Form the bottom of the package.                               | More than 90% of Lead to be covered by soldering                            | n =22 , c=0                |



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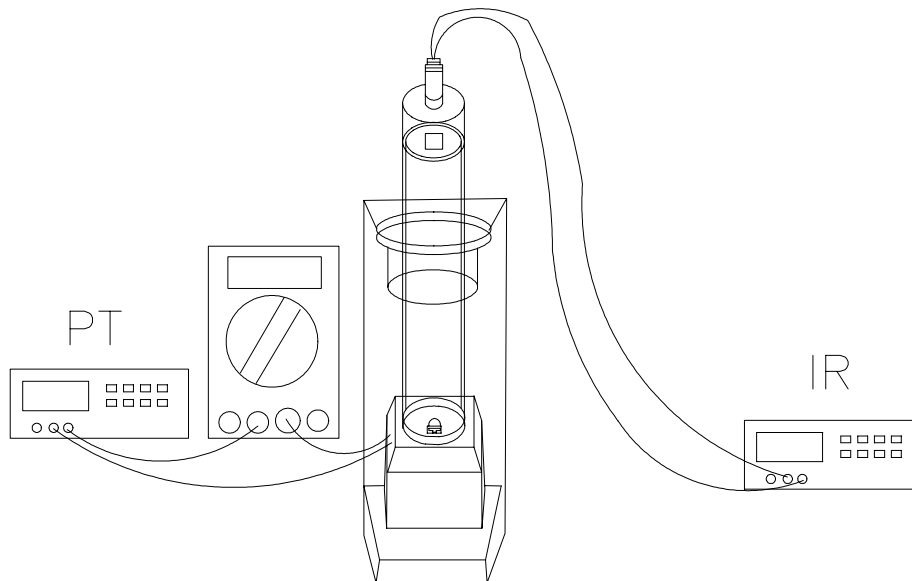
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### Test Method For On State Collector Current

Condition :  $H=1m\ W/c\ m^2$  ,  $V_{CE}=5V$

Test Item : Photocurrent (unit :  $mA$ )



### Supplements

1.Parts

(1) Chip

| Type | Material | Wavelength of Peak Sensitivity |
|------|----------|--------------------------------|
| PT   | Silicon  | 980nm                          |

(2) Material

| Type     | Lead Frame | Wire | Package |
|----------|------------|------|---------|
| Material | BT         | Gold | Epoxy   |



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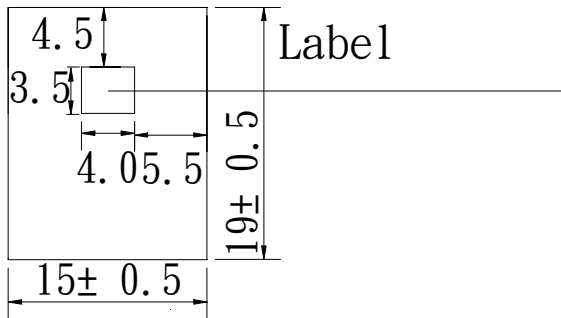
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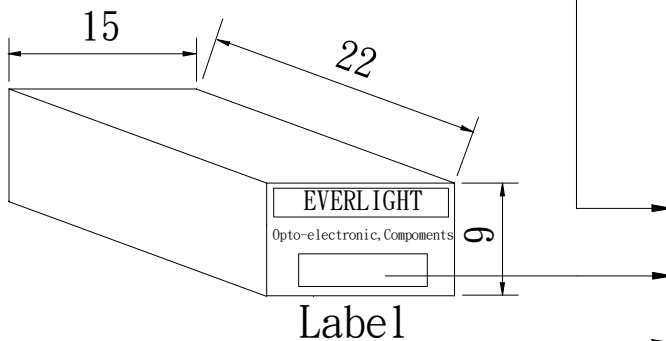
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## Packing Specifications

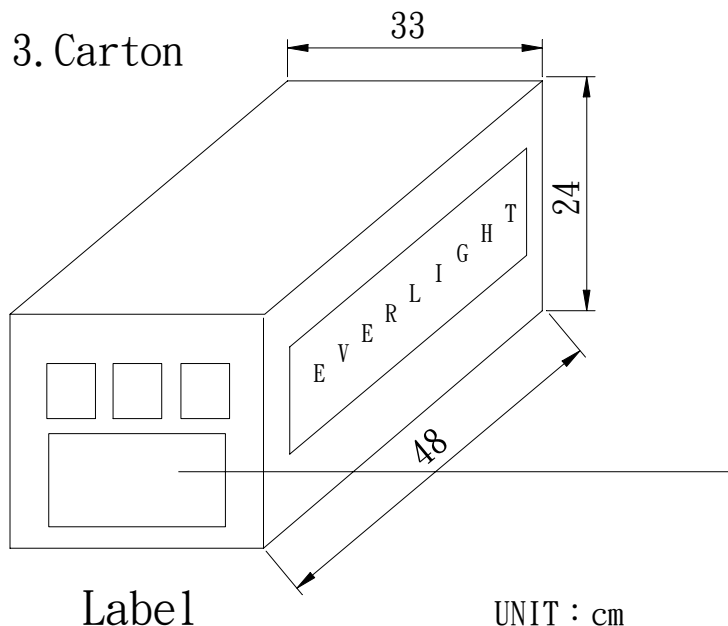
### 1. Bag



### 2. Box



### 3. Carton



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

1.1K Pcs/1Bag , 20 Bags/1Box

2.10Boxes/1Carton