



EVERLIGHT ELECTRONICS CO., LTD.

DEVICE NUMBER : DPT-028-007 REV : 2.0
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1.3mm Axial Flat Top Phototransistor

MODEL NO : PT28-21B

■ Features :

- Fast response time
- High photo sensitivity

■ Description :

- PT28-21B 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.

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■ Applications :

- Optoelectronic switch
- VCRs , Video camera
- Floppy disk drive
- Infrared applied system

| PART NO. | CHIP | LENS COLOR |
|----------|----------|------------|
| | MATERIAL | |
| PT | Silicon | Black |


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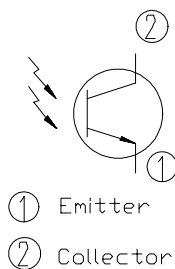
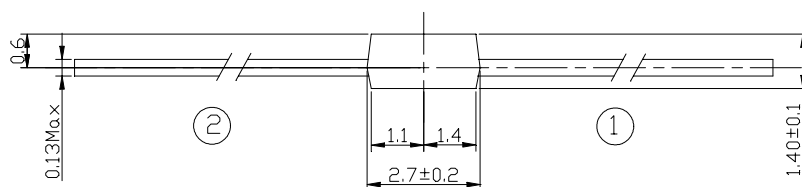
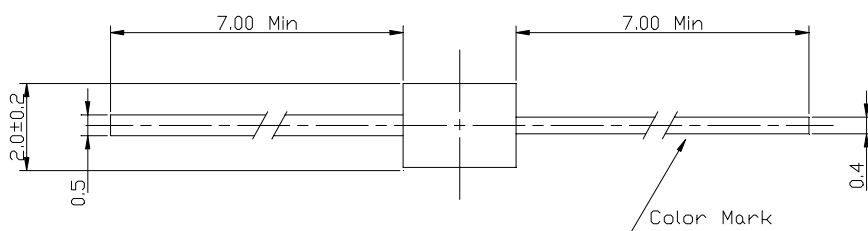
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1.3mm Axial Flat Top Phototransistor

 MODEL NO : PT28-21B

Package Dimensions:



① Emitter

② Collector

Notes :

- All dimensions are in millimeter.
- General Tolerance: $\pm 0.1\text{mm}$
- Lens color : Black.
- Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
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- 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 $T_A = 25^\circ\text{C}$

| 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 | T_{opr} | -25 ~ +85 | $^\circ\text{C}$ | |
| Storage Temperature | T_{stg} | -40 ~ +85 | $^\circ\text{C}$ | |
| Soldering Temperature | T_{sol} | 260 | $^\circ\text{C}$ | 4mm from mold body less than 5 seconds |
| Power Dissipation at(or below) 25 $^\circ\text{C}$ Free Air Temperature | P_c | 75 | mW | |

■ Electronic Optical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|---|-----------------|------|------------|------|---------------|--|
| Collector-Emitter Breakdown Voltage | BV_{CEO} | 30 | ---- | ---- | V | $I_C=100\mu\text{A}$ $E_e=0\text{mW}/\text{cm}^2$ |
| Emitter-Collector Breakdown Voltage | BV_{ECO} | 5 | ---- | ---- | V | $I_E=100\mu\text{A}$ $E_e=0\text{mW}/\text{cm}^2$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | ---- | ---- | 0.4 | V | $I_C=2\text{mA}$ $E_e=1\text{mW}/\text{cm}^2$ |
| Rise Time | t_r | ---- | 15 | ---- | μS | $V_{CE}=5\text{V}$ $I_C=1\text{mA}$ $R_L=1000\Omega$ |
| Fall Time | t_f | ---- | 15 | ---- | | |
| Collector Dark Current | I_{CEO} | ---- | ---- | 100 | nA | $V_{CE}=20\text{V}$ $E_e=0\text{mW}/\text{cm}^2$ |
| On State Collector Current | $I_{C(on)}$ | 0.1 | 0.3 | ---- | mA | $V_{CE}=5\text{V}$ $E_e=1\text{mW}/\text{cm}^2$ |
| Wavelength of Peak Sensitivity | λ_p | ---- | 980 | ---- | nm | ---- |
| Rang of Spectral Bandwidth | $\lambda_{0.5}$ | ---- | 770---1200 | ---- | nm | ---- |



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Typical Electrical/Optical/Characteristics Curves

Fig.1 Collector Power Dissipation vs. Ambient Temperature

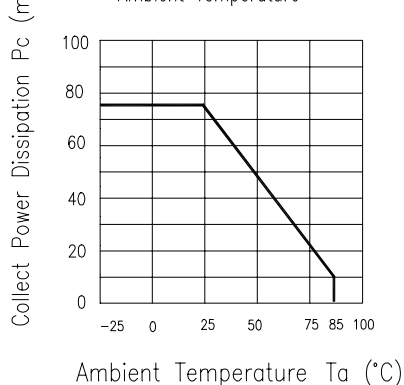


Fig.2 Collector Dark Current vs. Ambient Temperature

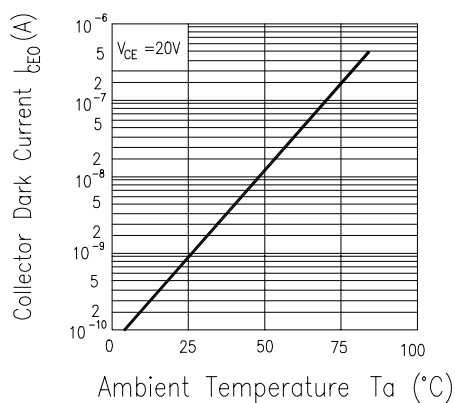


Fig. 3 Relative Collector Current vs. Ambient Temperature

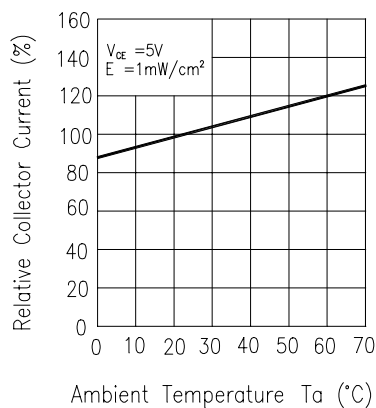


Fig.4 Collector Current vs. Irradiance

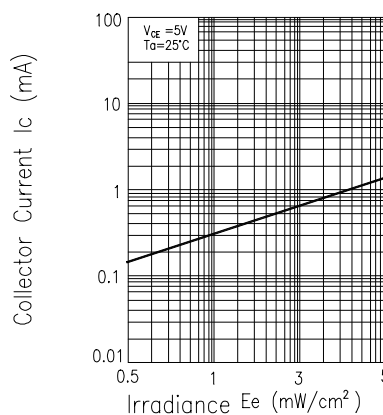


Fig.5 Spectral Sensitivity

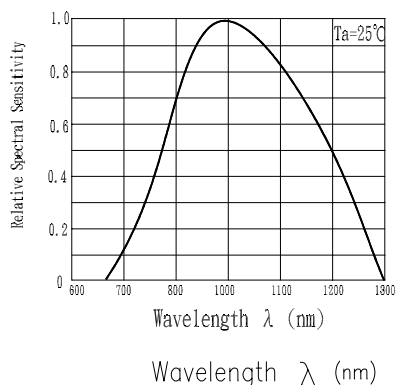
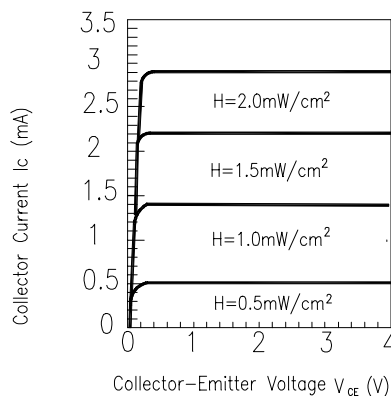


Fig.6 Collector Current vs. Collector-Emitter Voltage





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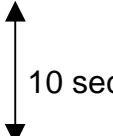
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■ Reliability Test Item And Condition

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

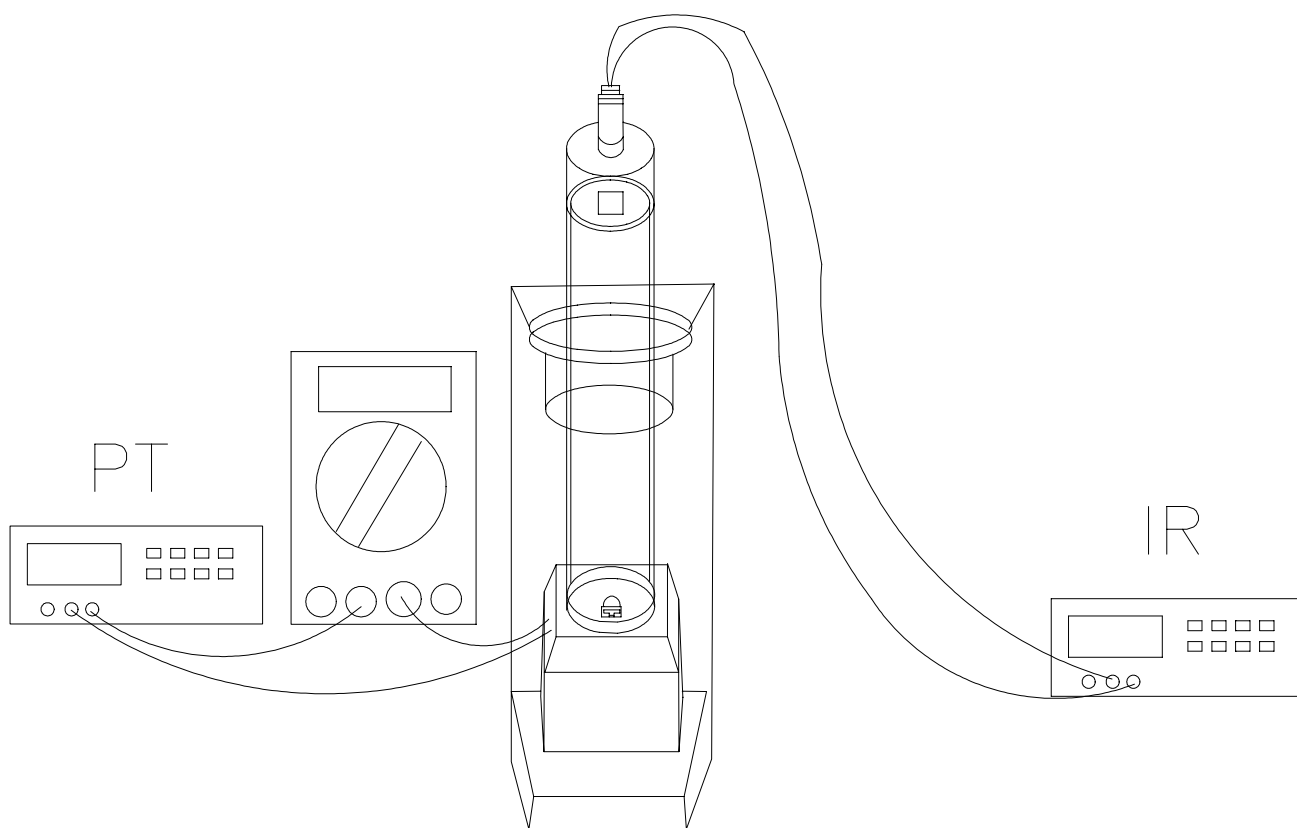
Confidence level:90%

LTPD:10%

| NO. | Item | Test Conditions | Test Hours/ Cycles | Sample Size | Failure Judgement Criteria | Ac/Re |
|-----|----------------------------------|--|-----------------------|-------------|---|-------|
| 1 | Solder Heat | TEMP : 260°C ± 5 °C | 5 secs | 22 pcs | $I_{c(on)} \leq L \times 0.8$ L :Lower specification limit | 0/1 |
| 2 | Temperature Cycle | H : +85°C 30 mins  L : -55°C 30 mins | 50 cycles | 22 pcs | | 0/1 |
| 3 | Thermal Shock | H : +100°C 5 mins  L : -10°C 5 mins | 50 cycles | 22 pcs | | 0/1 |
| 4 | High Temperature Storage | TEMP. : +100°C | 1000 hrs | 22 pcs | | 0/1 |
| 5 | Low Temperature Storage | TEMP. : -55°C | 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°C / 85% R.H. | 1000 hrs | 22 pcs | | 0/1 |

DEVICE NUMBER : DPT-028-007 REV : 2.0
ECN : _____ PAGE : 6/7**1.3mm Axial Flat Top Phototransistor**MODEL NO : PT28-21B**Test Method For On State Collector Current :**Condition : $E_e=1\text{mW}/\text{cm}^2$, $V_{CE}=5\text{V}$ Test Item : Collector Current [$I_{C(on)}$]

Unit : mA





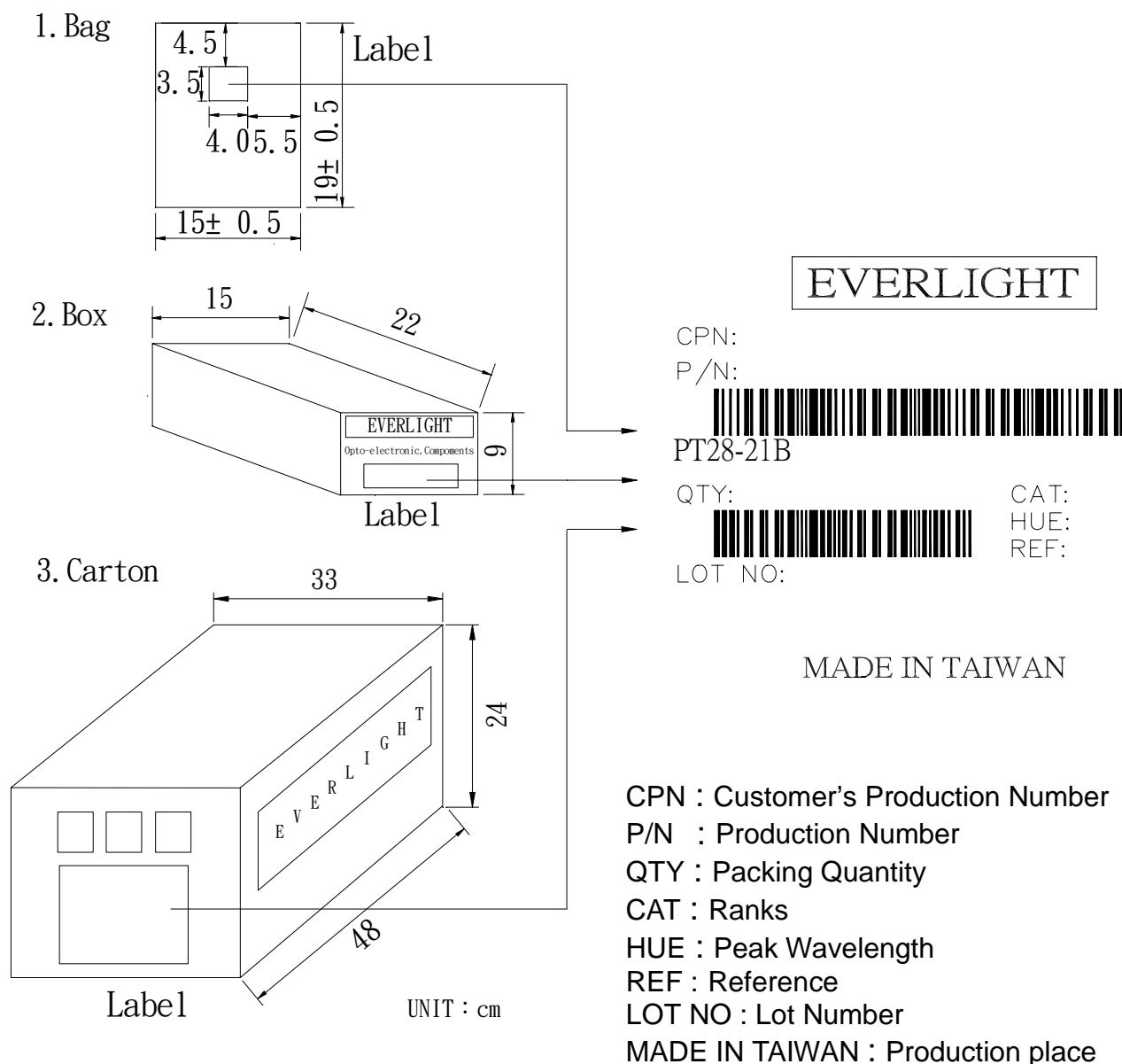
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■ Packing Specifications



■ Packing Quantity Specification

1. 1000 Pcs/1Bag · 20 Bags/1Box
2. 10 Boxes/1Carton

PT28-21B