

# PNZ108CL

## Silicon NPN Phototransistor

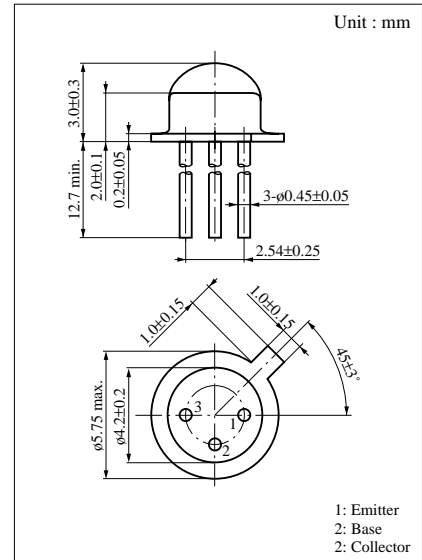
For optical control systems

### ■ Features

- High sensitivity :  $I_{CE(L)} = 3.5 \text{ mA (min.)}$  (at  $L = 500 \text{ lx}$ )
- Wide directional sensitivity for easy use
- Fast response :  $t_r = 5 \mu\text{s (typ.)}$
- Signal mixing capability using base pin
- Small size (low in height) package

### ■ Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

| Parameter                     | Symbol    | Rated       | Unit             |
|-------------------------------|-----------|-------------|------------------|
| Collector to emitter voltage  | $V_{CEO}$ | 20          | V                |
| Collector to base voltage     | $V_{CBO}$ | 30          | V                |
| Emitter to collector voltage  | $V_{ECO}$ | 3           | V                |
| Emitter to base voltage       | $V_{EBO}$ | 5           | V                |
| Collector current             | $I_C$     | 20          | mA               |
| Collector power dissipation   | $P_C$     | 100         | mW               |
| Operating ambient temperature | $T_{opr}$ | -25 to +85  | $^\circ\text{C}$ |
| Storage temperature           | $T_{stg}$ | -30 to +100 | $^\circ\text{C}$ |

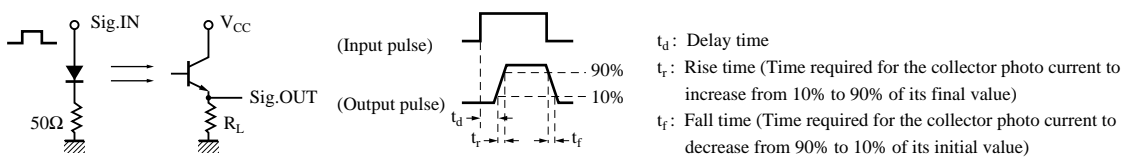


### ■ Electro-Optical Characteristics ( $T_a = 25^\circ\text{C}$ )

| Parameter                    | Symbol           | Conditions   | min | typ  | max | Unit          |
|------------------------------|------------------|--|-----|------|-----|---------------|
| Dark current                 | $I_{CEO}$        | $V_{CE} = 10\text{V}$                                  |     | 0.05 | 2   | $\mu\text{A}$ |
| Collector photo current      | $I_{CE(L)}^{*3}$ | $V_{CE} = 10\text{V}, L = 500 \text{ lx}^{*1}$         | 3.5 | 6    |     | mA            |
| Peak sensitivity wavelength  | $\lambda_p$      | $V_{CE} = 10\text{V}$                                  |     | 900  |     | nm            |
| Acceptance half angle        | $\theta$         | Measured from the optical axis to the half power point |     | 80   |     | deg.          |
| Rise time                    | $t_r^{*2}$       | $V_{CC} = 10\text{V}, I_{CE(L)} = 5\text{mA}$          |     | 5    |     | $\mu\text{s}$ |
| Fall time                    | $t_f^{*2}$       | $R_L = 100\Omega$                                      |     | 6    |     | $\mu\text{s}$ |
| Collector saturation voltage | $V_{CE(sat)}$    | $I_{CE(L)} = 1\text{mA}, L = 1000 \text{ lx}^{*1}$     |     | 0.3  | 0.6 | V             |

\*1 Measurements were made using a tungsten lamp (color temperature  $T = 2856\text{K}$ ) as a light source.

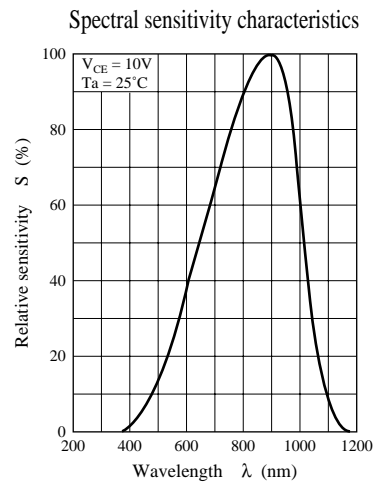
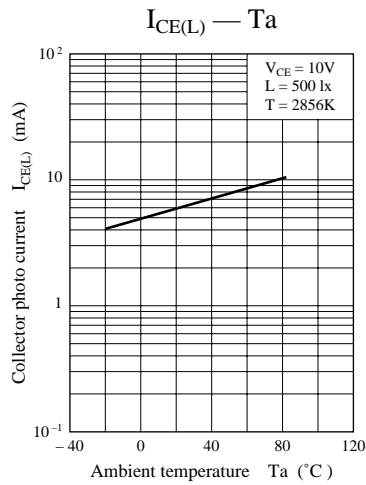
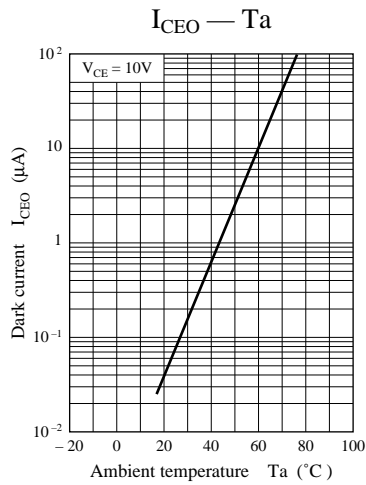
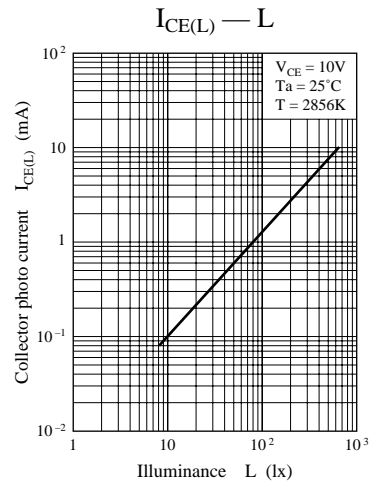
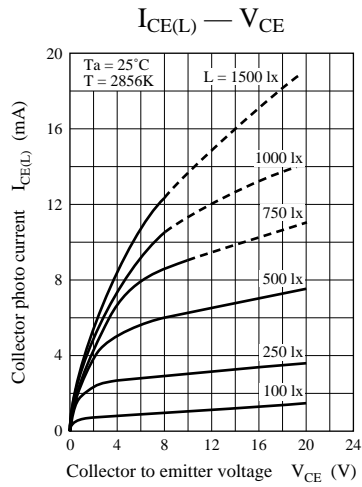
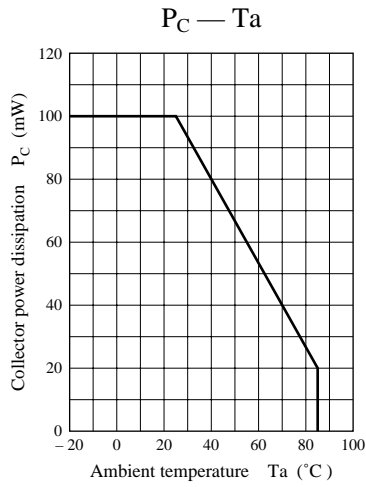
\*2 Switching time measurement circuit



\*3  $I_{CE(L)}$  Classifications

| Class            | Q          | R          | S     |
|------------------|------------|------------|-------|
| $I_{CE(L)}$ (mA) | 3.5 to 6.0 | 5.0 to 9.1 | > 7.5 |

Note) Difficult to guarantee compliance with moisture resistance standard (MIL-STD-202D).



**Directivity characteristics**

