

# PNZ102 (PN102)

## Silicon NPN Phototransistor

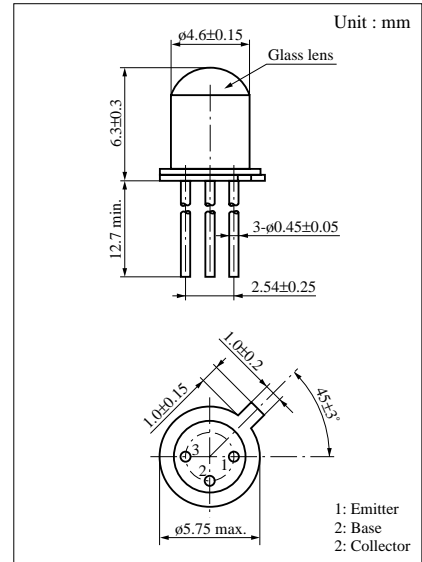
For optical control systems

### ■ Features

- High sensitivity
- Wide spectral sensitivity, suited for detecting GaAs LEDs
- Low dark current :  $I_{CEO} = 5 \text{ nA}$  (typ.)
- Fast response :  $t_r, t_f = 3 \mu\text{s}$  (typ.)
- Base pin for easy circuit design
- TO-18 standard type package

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

Parameter	Symbol	Ratings	Unit
Collector to emitter voltage	$V_{CEO}$	30	V
Collector to base voltage	$V_{CBO}$	40	V
Emitter to collector voltage	$V_{ECO}$	5	V
Emitter to base voltage	$V_{EBO}$	5	V
Collector current	$I_C$	50	mA
Collector power dissipation	$P_C$	150	mW
Operating ambient temperature	$T_{opr}$	-25 to +85	$^\circ\text{C}$
Storage temperature	$T_{stg}$	-30 to +100	$^\circ\text{C}$

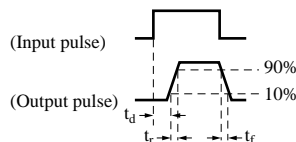
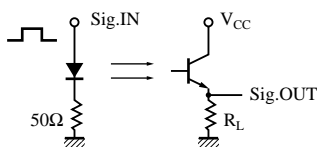


### ■ Electro-Optical Characteristics ( $T_a = 25^\circ\text{C}$ )

Parameter	Symbol	Conditions	min	typ	max	Unit
Dark current	$I_{CEO}$	$V_{CE} = 10\text{V}$		5	300	nA
Collector photo current	$I_{CE(L)}$	$V_{CE} = 10\text{V}, L = 100 \text{ lx}^{*1}$	1.5	3.5		mA
Peak sensitivity wave length	$\lambda_p$	$V_{CE} = 10\text{V}$		800		nm
Acceptance half angle	$\theta$	Measured from the optical axis to the half power point		10		deg.
Response time	$t_r, t_f^{*2}$	$V_{CC} = 10\text{V}, I_{CE(L)} = 5\text{mA}, R_L = 100\Omega$		3		$\mu\text{s}$
Collector saturation voltage	$V_{CE(sat)}$	$I_{CE(L)} = 1\text{mA}, L = 500 \text{ lx}^{*1}$		0.2	0.4	V

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

\*2 Switching time measurement circuit

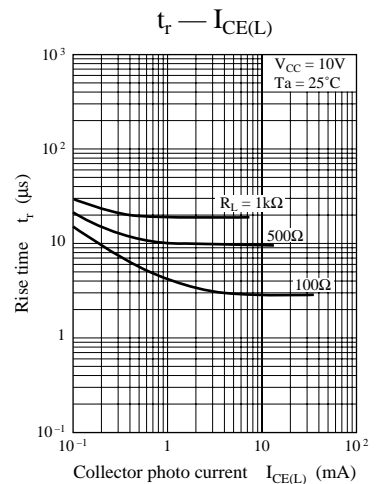
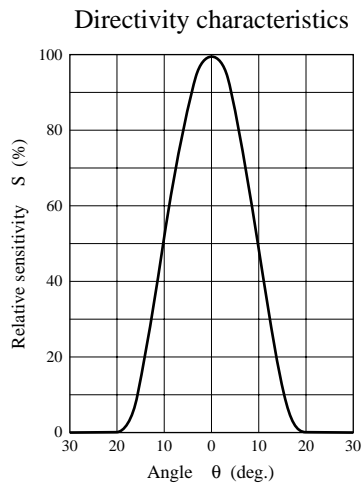
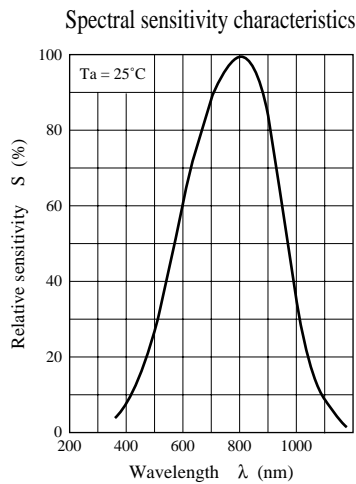
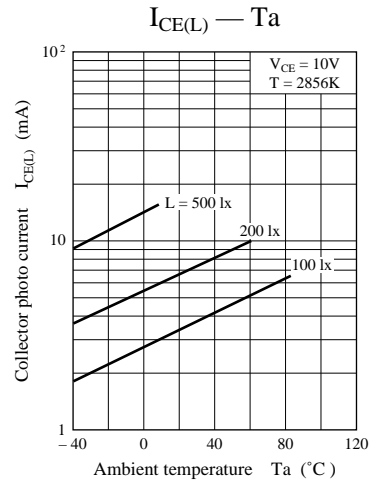
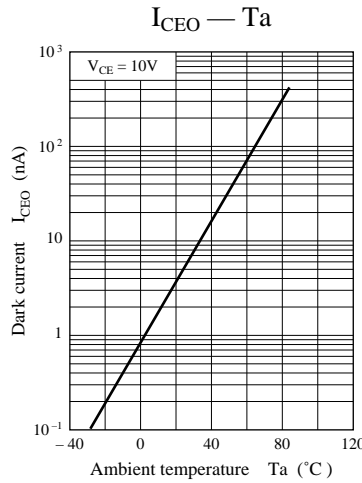
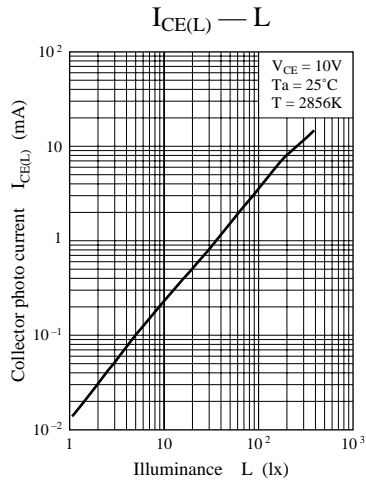
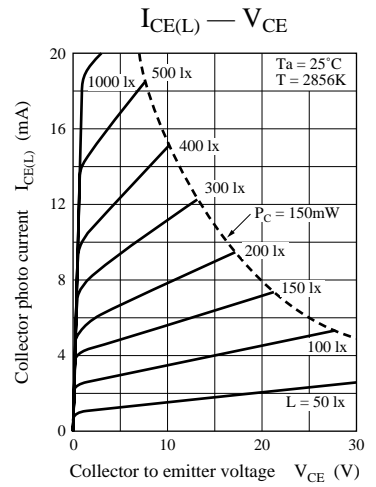
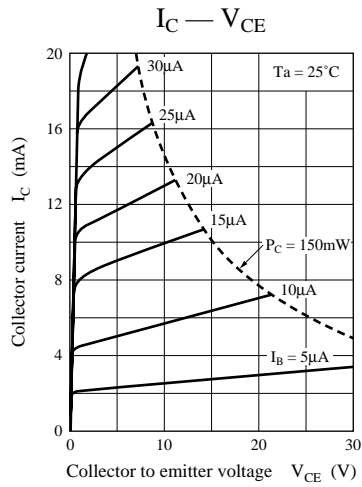
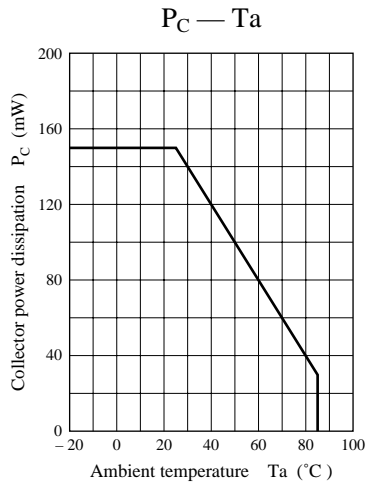


$t_d$ : Delay time

$t_r$ : Rise time (Time required for the collector photo current to increase from 10% to 90% of its final value)

$t_f$ : Fall time (Time required for the collector photo current to decrease from 90% to 10% of its initial value)

Note) The part number in the parenthesis shows conventional part number.



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