

# PNZ107, PNZ108 (PN107, PN108)

## Silicon NPN Phototransistors

For optical control systems

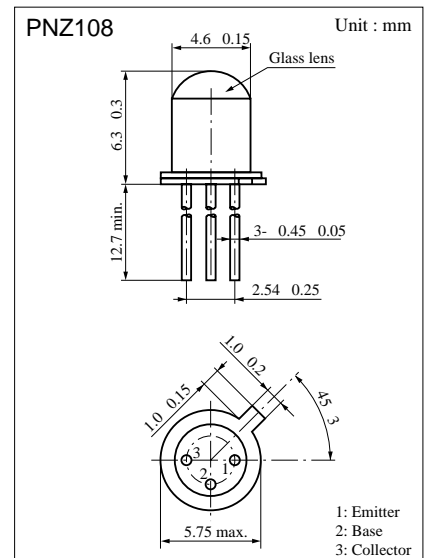
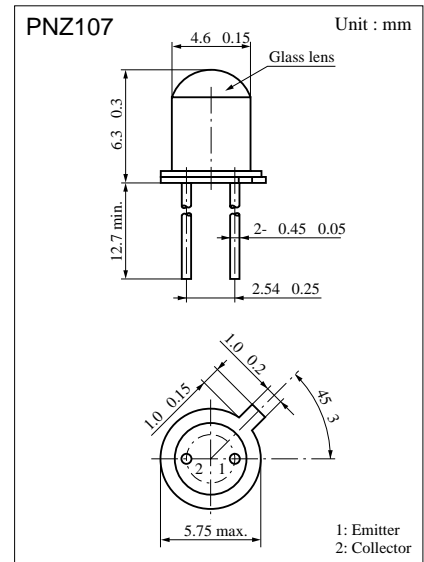
### ■ Features

- High sensitivity :  $I_{CE(L)} = 5 \text{ mA (min.)}$  (at  $L = 100 \text{ lx}$ )
- Narrow directional sensitivity for effective use of light input
- Fast response :  $t_r = 5 \mu\text{s (typ.)}$
- Signal mixing capability using base pin (PNZ0108)
- TO-18 standard type package

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

Parameter	Symbol	Ratings	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	$I_C$	30	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	$^\circ\text{C}$

\* PNZ108 only



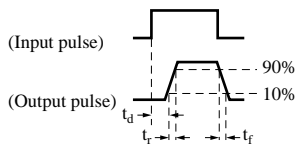
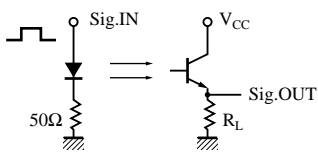
Note) The part numbers in the parenthesis show conventional part number.

■ Electro-Optical Characteristics (Ta = 25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Dark current	$I_{CEO}$	$V_{CE} = 10V$		0.05	2	$\mu A$
Collector photo current	$I_{CE(L)}$	$V_{CE} = 10V, L = 100 \text{ lx}^{*1}$	5		15	mA
Peak sensitivity wavelength	$\lambda_p$	$V_{CE} = 10V$		900		nm
Acceptance half angle	$\theta$	Measured from the optical axis to the half power point		10		deg.
Rise time	$t_r^{*2}$	$V_{CC} = 10V, I_{CE(L)} = 5mA$		5		$\mu s$
Fall time	$t_f^{*2}$	$R_L = 100\Omega$		6		$\mu s$
Collector saturation voltage	$V_{CE(sat)}$	$I_{CE(L)} = 1mA, L = 500 \text{ lx}^{*1}$		0.3	0.6	V

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

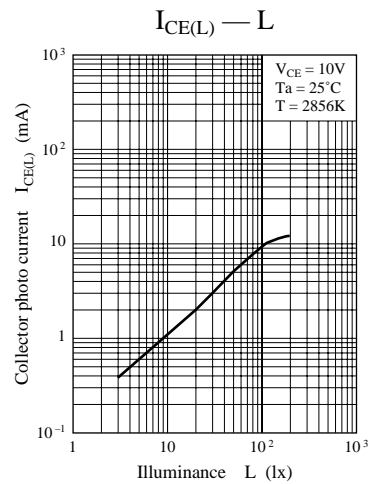
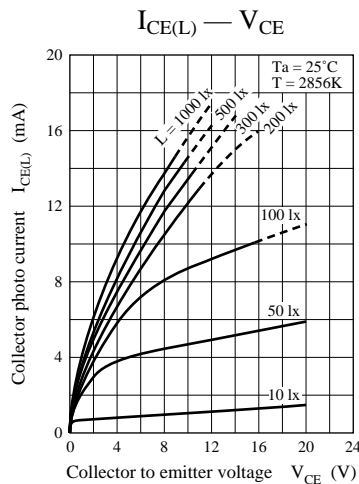
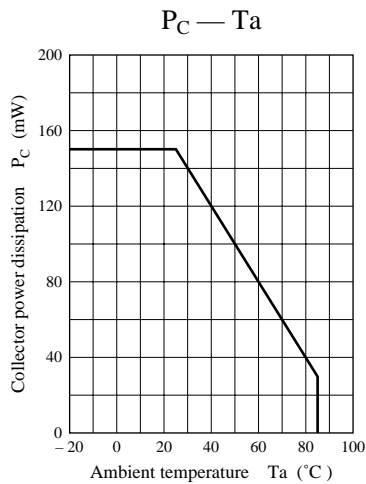
\*2 Switching time measurement circuit

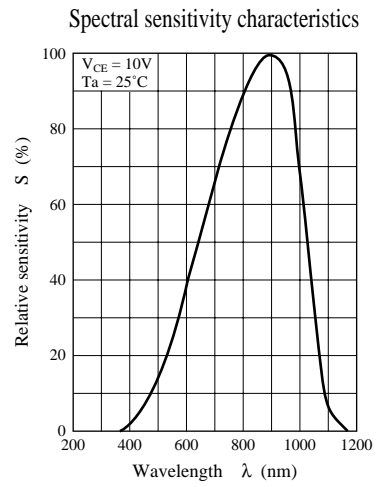
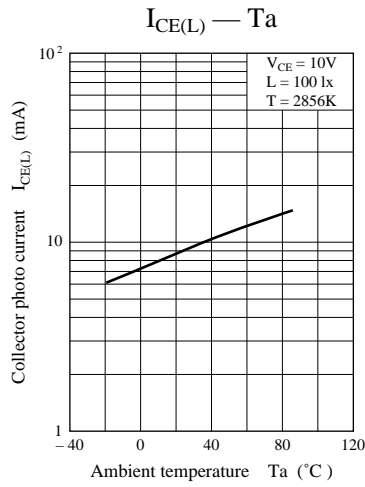
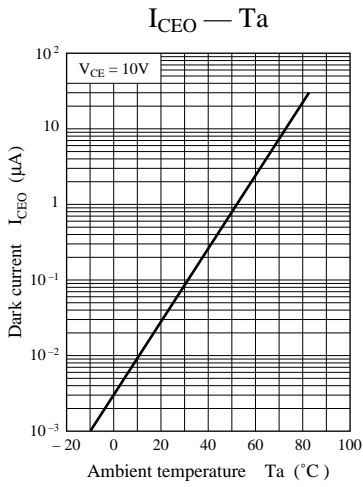


$t_d$ : Delay time

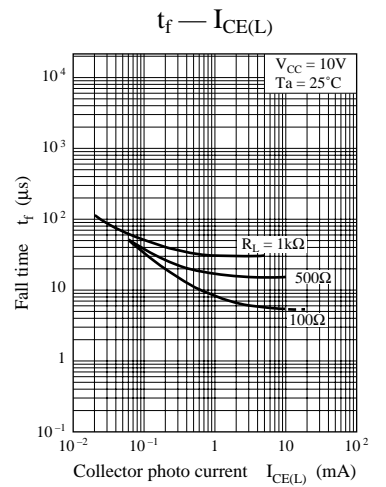
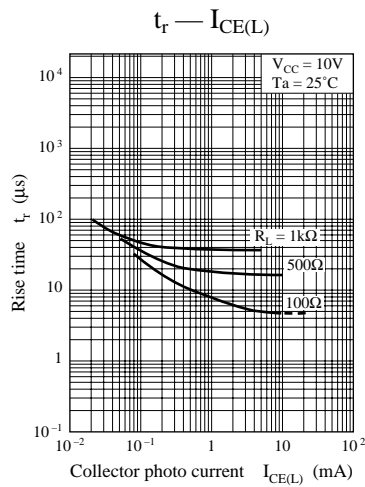
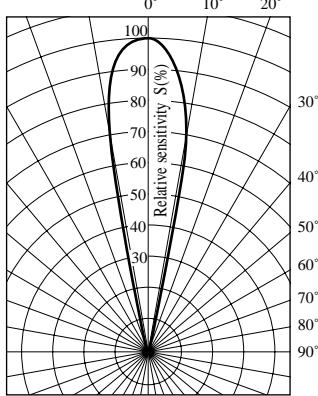
$t_r$ : Rise time (Time required for the collector photo current to increase from 10% to 90% of its final value)

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





**Directivity characteristics**



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