

# PNZ109CL (PN109CL)

## Silicon planar type

For optical control systems

### ■ Features

- High sensitivity:  $I_{CE(L)} = 2 \text{ mA (min.)}$
- Wide directivity characteristics for easy use
- Fast response:  $t_r = 5 \mu\text{s (typ.)}$
- Signal mixing capability using base pin
- Small size (low in height) package
- Resin to cutoff visible light is used

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

Parameter	Symbol	Rating	Unit
Collector-emitter voltage (Base open)	$V_{CEO}$	20	V
Collector-base voltage (Emitter open)	$V_{CBO}$	30	V
Emitter-collector voltage (Base open)	$V_{ECO}$	3	V
Emitter-base voltage (Collector open)	$V_{EBO}$	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	$^\circ\text{C}$

### ■ Electrical-Optical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Photocurrent *1	$I_{CE(L)}$	$V_{CE} = 10 \text{ V}, L = 500 \text{ lx}$	2.5	4.0		mA
Dark current	$I_{CEO}$	$V_{CE} = 10 \text{ V}$		0.05	2.00	$\mu\text{A}$
Peak emission wavelength	$\lambda_p$	$V_{CE} = 10 \text{ V}$		900		nm
Half-power angle	$\theta$	The angle from which photocurrent becomes 50%		80		$^\circ$
Rise time *2	$t_r$	$V_{CC} = 10 \text{ V}, I_{CE(L)} = 5 \text{ mA}, R_L = 100 \Omega$		5		$\mu\text{s}$
Fall time *2	$t_f$			6		$\mu\text{s}$
Collector-emitter saturation voltage *1	$V_{CE(sat)}$	$I_{CE(L)} = 1 \text{ mA}, L = 1000 \text{ lx}$		0.3	0.6	V

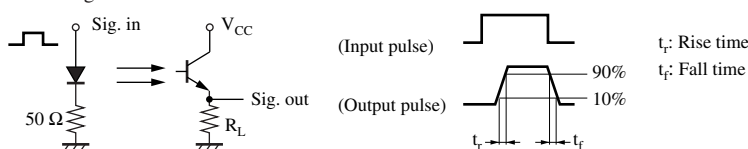
Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.

2. Spectral sensitivity characteristics: Sensitivity for wave length over 400 nm maximum sensitivity ratio is 100%.

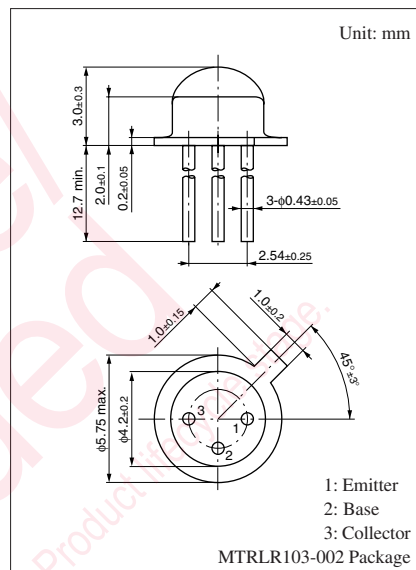
3. This device is designed be disregarded radiation.

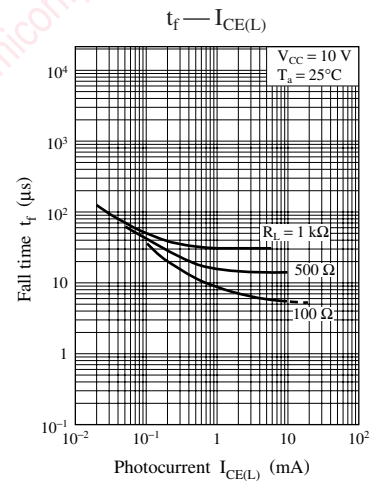
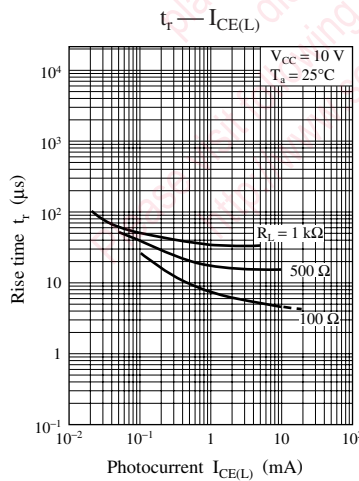
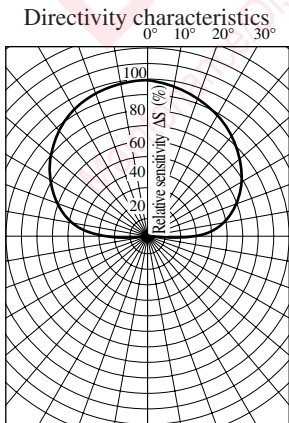
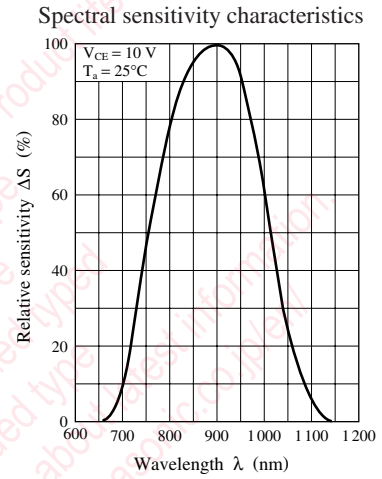
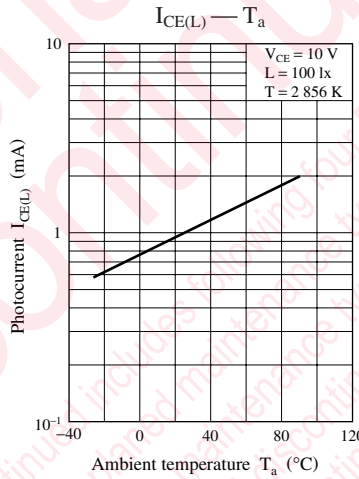
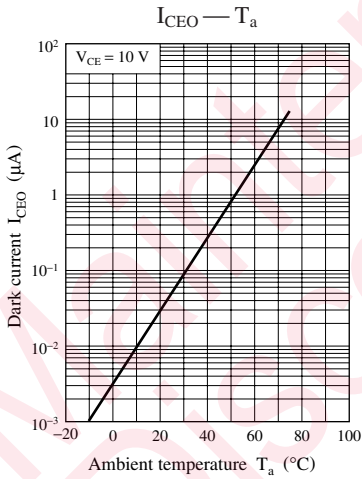
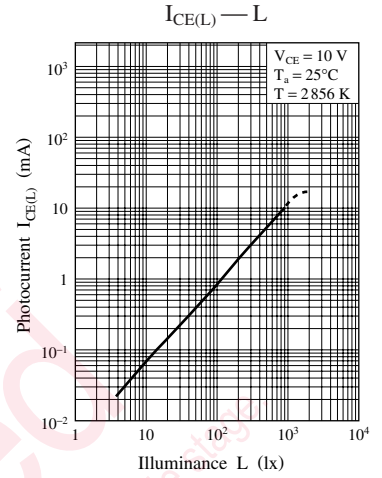
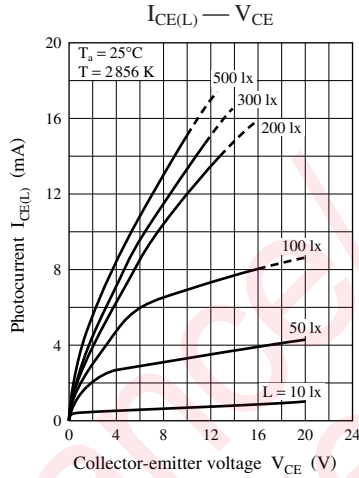
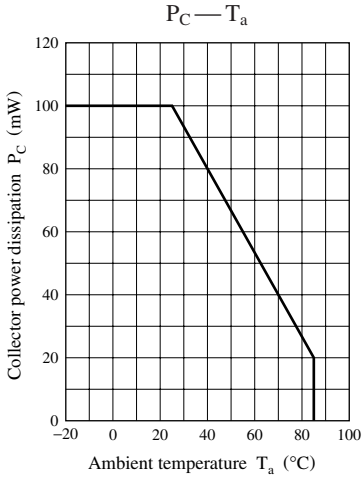
4. \*1: Source: Tungsten (color temperature 2856 K)

\*2: Switching time measurement circuit



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





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