

PNZ202S (PN202S)

Darlington Phototransistor

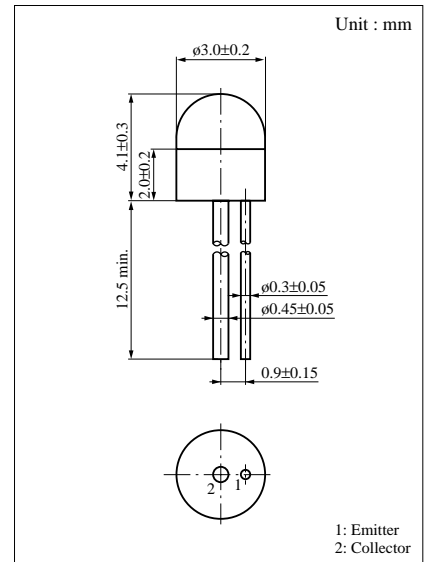
For optical control systems

■ Features

- Darlington output, high sensitivity
- Easy to combine with red and infrared light emitting diodes
- Small size ($\phi 3$) ceramic package

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

Parameter	Symbol	Ratings	Unit
Collector to emitter voltage	V_{CEO}	20	V
Emitter to collector voltage	V_{ECO}	5	V
Collector current	I_{C}	30	mA
Collector power dissipation	P_{C}	100	mW
Operating ambient temperature	T_{opr}	-25 to +80	$^\circ\text{C}$
Storage temperature	T_{stg}	-30 to +100	$^\circ\text{C}$

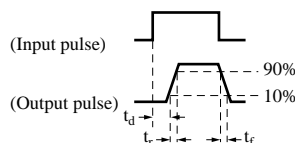
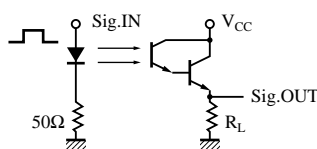


■ Electro-Optical Characteristics ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Dark current	I_{CEO}	$V_{\text{CE}} = 10\text{V}$		0.1	0.5	μA
Collector photo current	$I_{\text{CE(L)}}^{*3}$	$V_{\text{CE}} = 10\text{V}, L = 2 \text{ lx}^{*1}$	0.2		5	mA
Peak sensitivity wavelength	λ_{p}	$V_{\text{CE}} = 10\text{V}$		800		nm
Acceptance half angle	θ	Measured from the optical axis to the half power point		30		deg.
Response time	$t_{\text{r}}, t_{\text{f}}^{*2}$	$V_{\text{CC}} = 10\text{V}, I_{\text{CE(L)}} = 5\text{mA}, R_{\text{L}} = 100\Omega$		150		μs
Collector saturation voltage	$V_{\text{CE(sat)}}$	$I_{\text{CE(L)}} = 1\text{mA}, L = 100 \text{ lx}^{*1}$		0.7	1.5	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

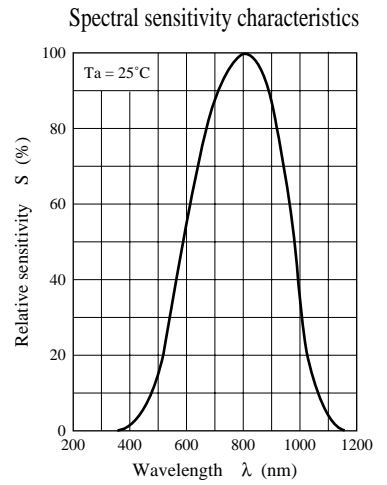
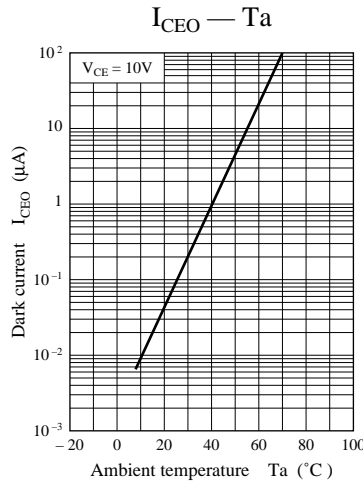
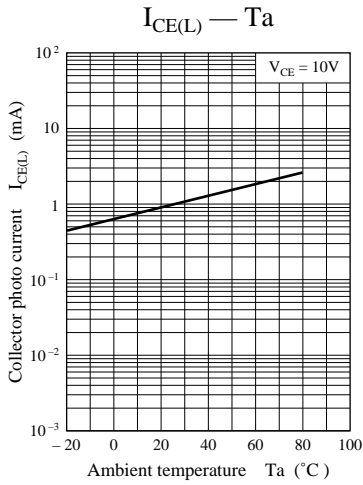
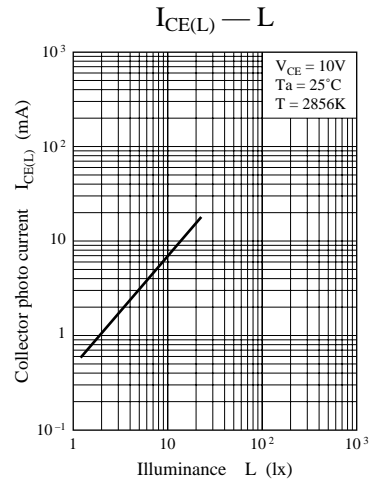
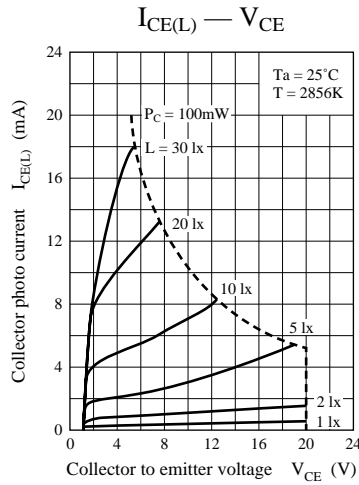
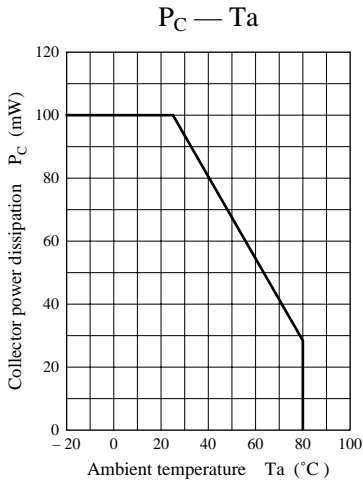
t_{r} : Rise time (Time required for the collector photo current to increase from 10% to 90% of its final value)

t_{f} : Fall time (Time required for the collector photo current to decrease from 90% to 10% of its initial value)

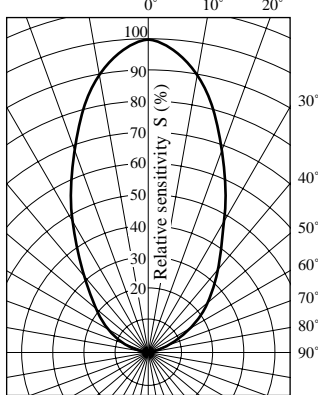
*3 $I_{\text{CE(L)}}$ Classifications

Class	Q	R	S
$I_{\text{CE(L)}} \text{ (mA)}$	0.2 to 0.8	0.6 to 1.65	1.35 to 5

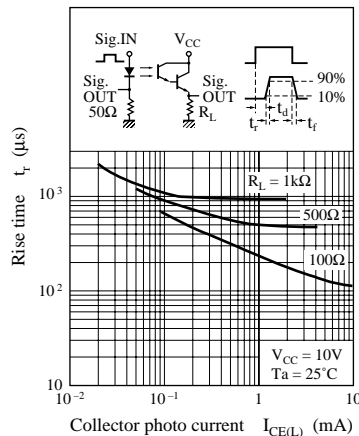
(Note) The part number in the parenthesis shows conventional part number.



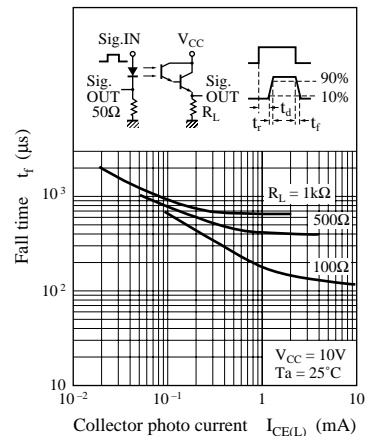
Directivity characteristics



$t_r - I_{CE(L)}$



$t_f - I_{CE(L)}$



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