

PNZ163NC (PN163-(NC))

Silicon NPN Phototransistor

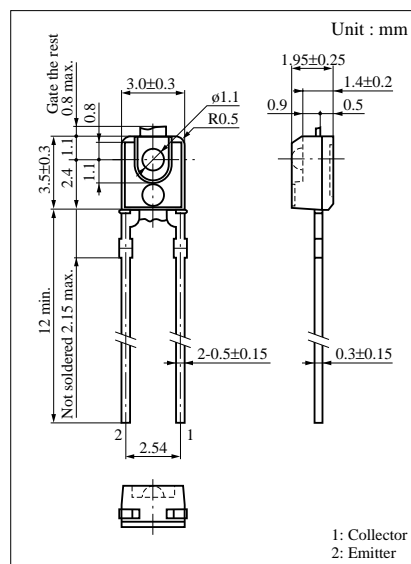
For optical control systems

■ Features

- High sensitivity
- Fast response : $t_r = 4 \mu s$ (typ.)
- Adoption of visible light cutoff resin
- Ultraminiature, thin side-view type package

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

Parameter	Symbol	Ratings	Unit
Collector to emitter voltage	V_{CEO}	20	V
Collector current	I_C	20	mA
Collector power dissipation	P_C	50	mW
Operating ambient temperature	T_{opr}	-25 to $+85$	$^\circ C$
Storage temperature	T_{stg}	-30 to $+100$	$^\circ C$

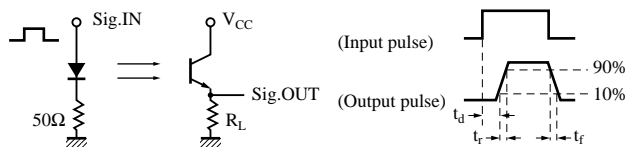


■ Electro-Optical Characteristics ($T_a = 25^\circ C$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Dark current	I_{CEO}	$V_{CE} = 10V$			0.2	μA
Sensitivity to infrared emitters	S_{IR}^{*1}	$V_{CE} = 10V, H = 15\mu W/cm^2$	6		40	μA
Peak sensitivity wavelength	λ_p	$V_{CE} = 10V$		850		nm
Acceptance half angle	θ	Measured from the optical axis to the half power point		25		deg.
Rise time	t_r^{*2}	$V_{CC} = 10V, I_{CE(L)} = 5mA$		4		μs
Fall time	t_f^{*2}	$R_L = 100\Omega$		4		μs
Collector saturation voltage	$V_{CE(sat)}$	$I_{CE(L)} = 3\mu A, H = 15\mu W/cm^2$			0.5	V

*1 Measurements were made using infrared light ($\lambda = 940$ nm) as a light source.

*2 Switching time measurement circuit

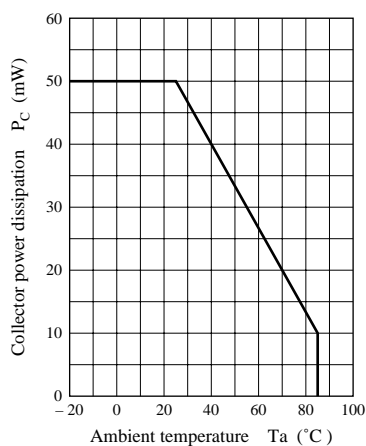
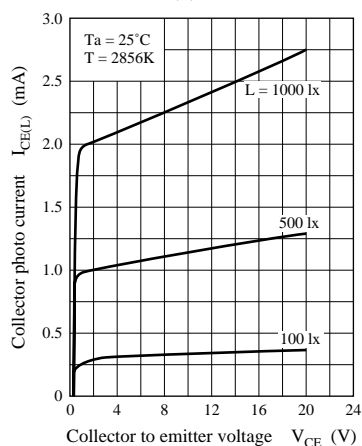
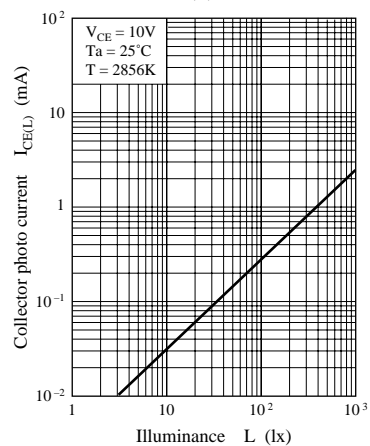
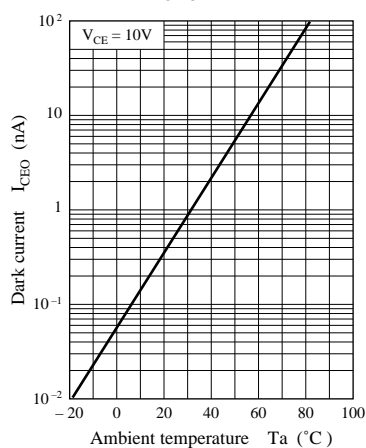
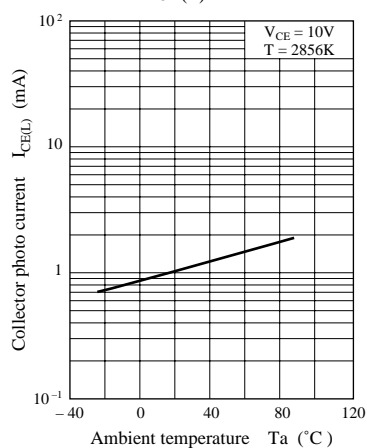


t_d : Delay time

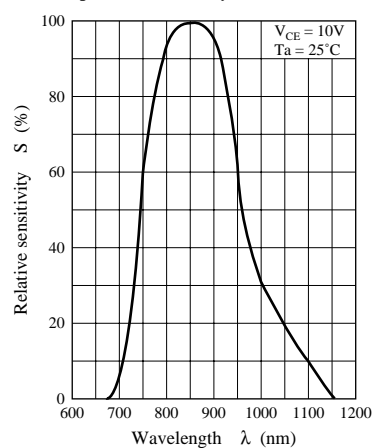
t_r : Rise time (Time required for the collector photo current to increase from 10% to 90% of its final value)

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

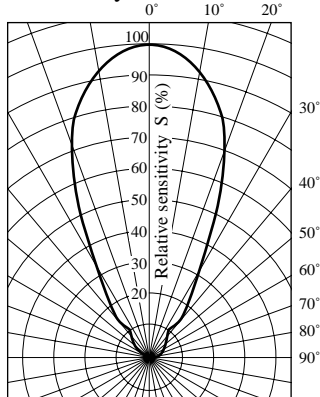
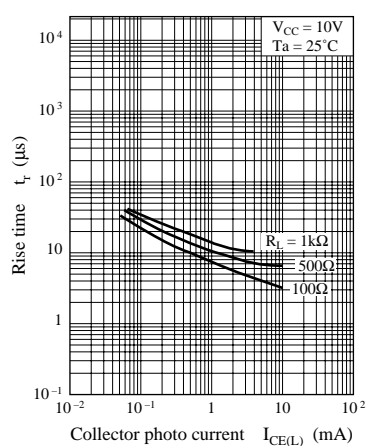
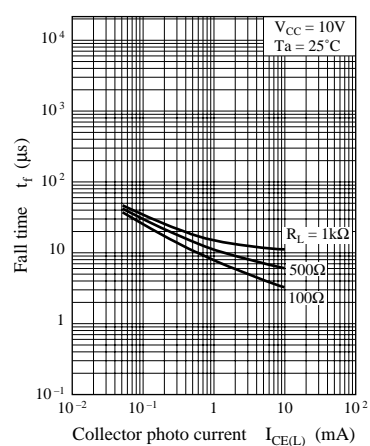
Note) The part number in the parenthesis shows conventional part number.

$P_C - T_a$  $I_{CE(L)} - V_{CE}$  $I_{CE(L)} - L$  $I_{CEO} - T_a$  $I_{CE(L)} - T_a$ 

Spectral sensitivity characteristics



Directivity characteristics

 $t_r - I_{CE(L)}$  $t_f - I_{CE(L)}$ 

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