

# PNZ163NC (PN163-(NC))

## Silicon NPN Phototransistor

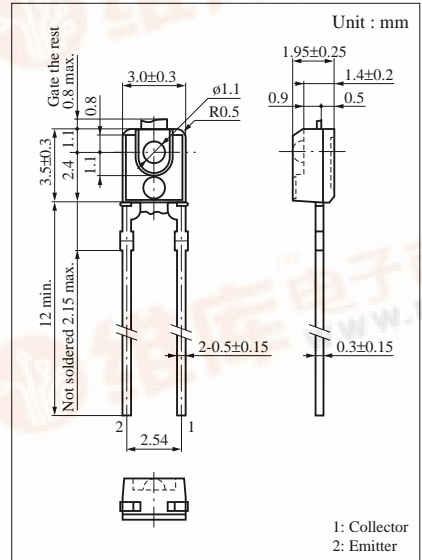
For optical control systems

### 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 (Ta = 25°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	°C
Storage temperature	$T_{stg}$	-30 to +100	°C

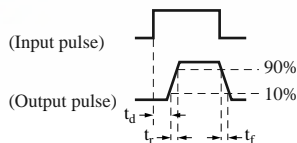
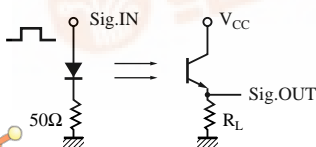


### Electro-Optical Characteristics (Ta = 25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Dark current	$I_{CEO}$	$V_{CE} = 10V$			0.2	$\mu A$
Sensitivity to infrared emitters	$S_{IR}^{*1}$	$V_{CE} = 10V, H = 15\mu W/cm^2$	6		40	$\mu A$
Peak sensitivity wavelength	$\lambda_p$	$V_{CE} = 10V$		850		nm
Acceptance half angle	$\theta$	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		$\mu s$
Fall time	$t_f^{*2}$	$R_L = 100\Omega$		4		$\mu s$
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 ( $\lambda = 940 \text{ nm}$ ) as a light source.

\*2 Switching time measurement circuit

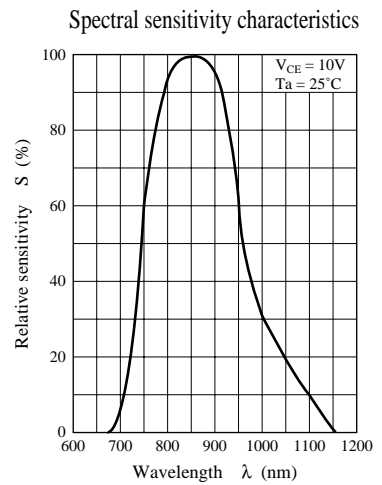
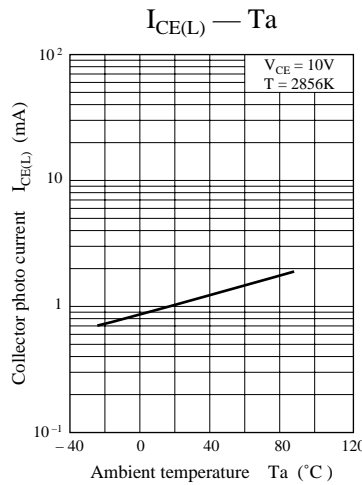
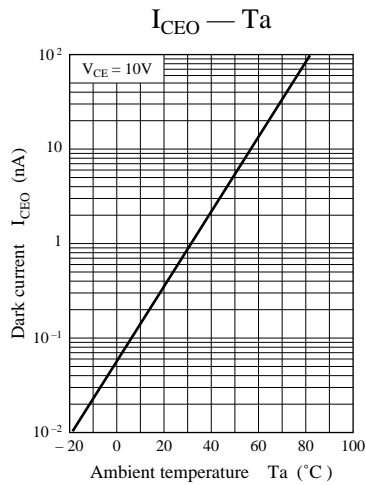
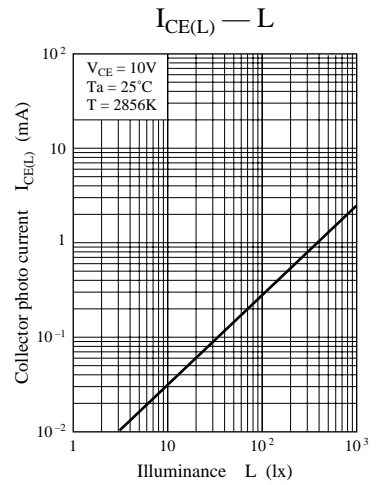
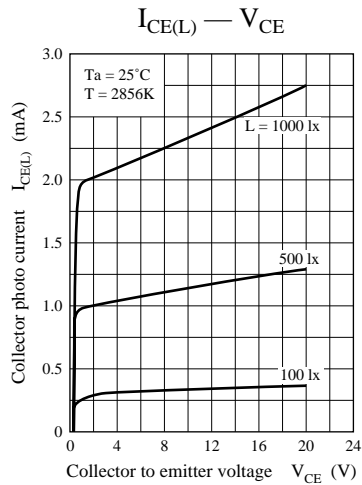
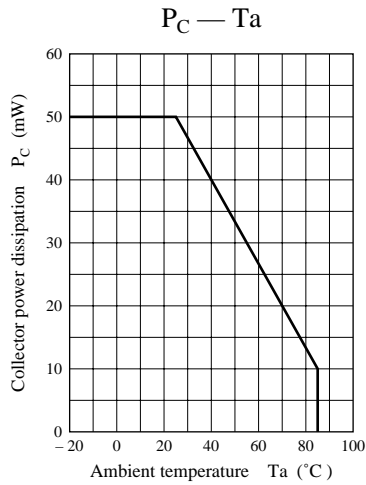


$t_d$ : Delay time

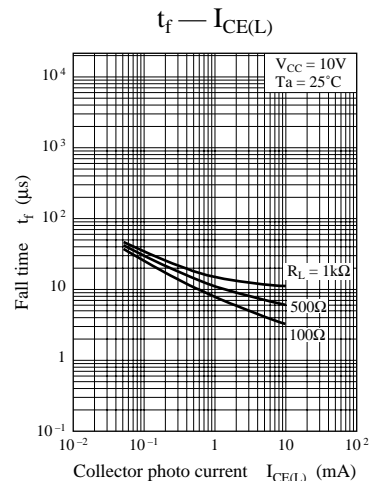
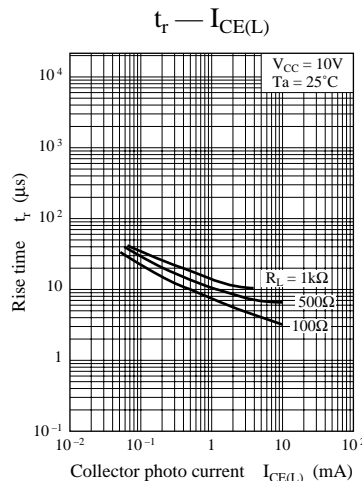
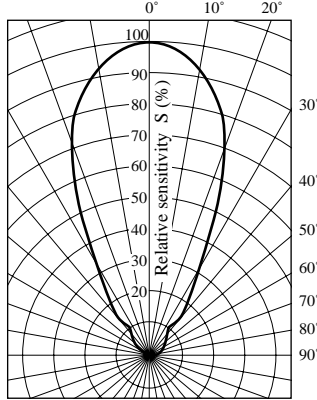
$t_r$ : Rise time (Time required for the collector photo current to increase from 10% to 90% of its final value)

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





**Directivity characteristics**



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