

PNA1605

Silicon NPN Phototransistor

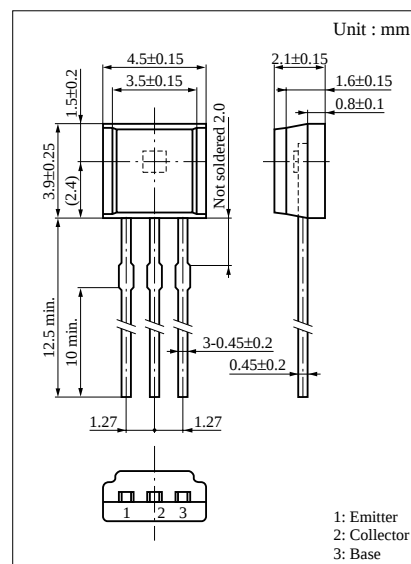
For optical control systems

Features

- High sensitivity
- Wide directional sensitivity, matched to GaAs LEDs : $\theta = 70^\circ$ (typ.)
- Fast response : $t_r, t_f = 8 \mu s$ (typ.)
- 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 to base voltage	V_{CBO}	30	V
Emitter to collector voltage	V_{ECO}	5	V
Emitter to base voltage	V_{EBO}	5	V
Collector current	I_C	10	mA
Collector power dissipation	P_C	100	mW
Operating ambient temperature	T_{opr}	-25 to +85	$^\circ C$
Storage temperature	T_{stg}	-30 to +100	$^\circ C$

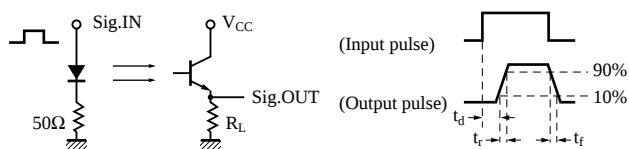


Electro-Optical Characteristics ($T_a = 25^\circ C$)

Parameter	Symbol	Conditions	min	typ	max	Unit
Dark current	I_{CEO}	$V_{CE} = 10V$		0.05	2	μA
Collector photo current	$I_{CE(L)}$	$V_{CE} = 10V, L = 100 \text{ lx}^{*1}$	0.2	0.8		mA
Peak sensitivity wavelength	λ_p	$V_{CE} = 10V$		900		nm
Acceptance half angle	θ	Measured from the optical axis to the half power point		70		deg.
Rise time	t_r^{*2}	$V_{CC} = 10V, I_{CE(L)} = 1mA$		8		μs
Fall time	t_f^{*2}	$R_L = 100\Omega$		9		μs
Collector saturation voltage	$V_{CE(sat)}$	$I_{CE(L)} = 1mA, L = 1000 \text{ lx}^{*1}$		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

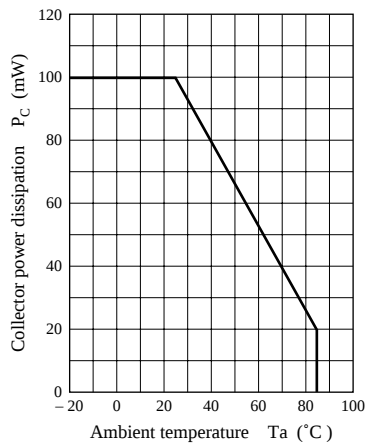


t_d : Delay time

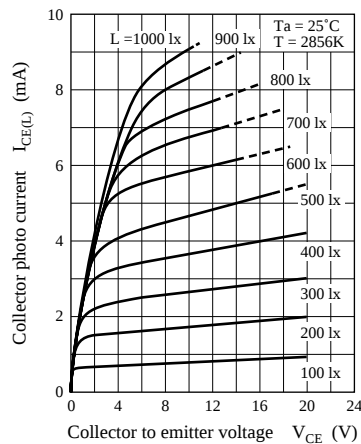
t_r : Rise time (Time required for the collector photo current to increase from 10% to 90% of its final value)

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

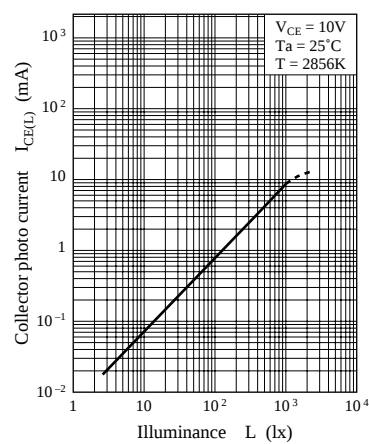
$P_C - T_a$



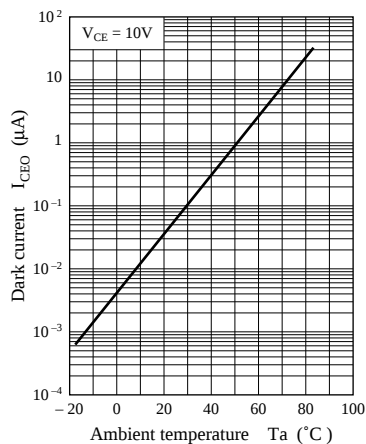
$I_{CE(L)} - V_{CE}$



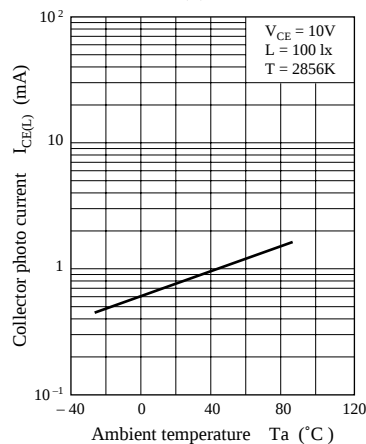
$I_{CE(L)} - L$



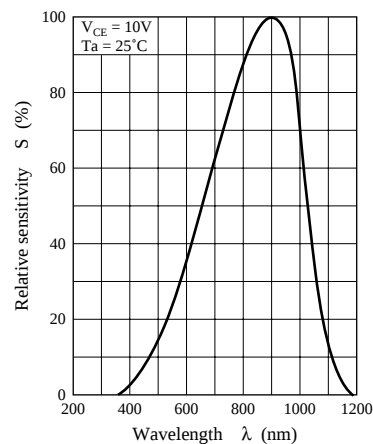
$I_{CEO} - T_a$



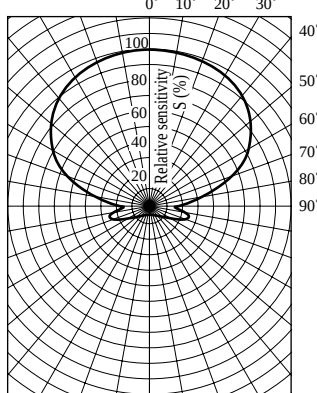
$I_{CE(L)} - T_a$



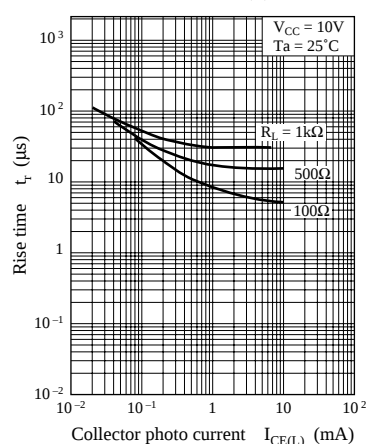
Spectral sensitivity characteristics



Directivity characteristics



$t_r - I_{CE(L)}$



$t_f - I_{CE(L)}$

