

PN147

Silicon NPN Phototransistor

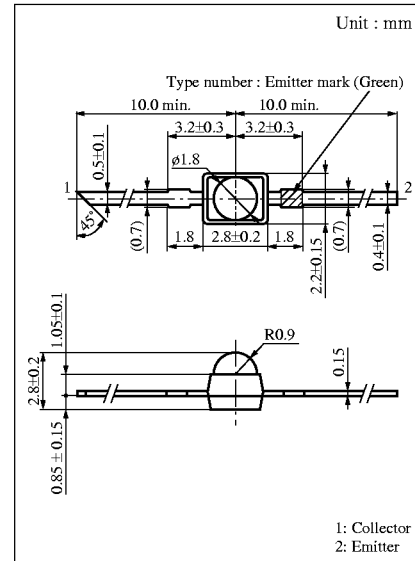
For optical control systems

■ Features

- High sensitivity
- Wide spectral responsivity, matched to GaAs LEDs
- Fast response : $t_r, t_f = 3 \mu s$ (typ.)
- Small size designed for easier mounting to printed circuit board

■ Absolute Maximum Ratings (Ta = 25°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	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

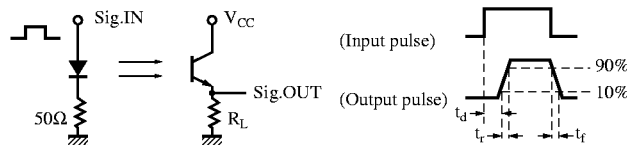


■ Electro-Optical Characteristics (Ta = 25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit
Dark current	I_{CEO}	$V_{CE} = 10V$		0.01	0.5	μA
Collector photo current	$I_{CE(L)1}^{*3}$	$V_{CE} = 10V, L = 2 lx^{*1}$	3	12		μA
	$I_{CE(L)2}$	$V_{CE} = 10V, L = 500 lx^{*1}$		3.5		mA
Peak sensitivity wavelength	λ_p	$V_{CE} = 10V$		800		nm
Acceptance half angle	θ	Measured from the optical axis to the half power point		24		deg.
Response time	t_r, t_f^{*2}	$V_{CC} = 10V, I_{CE(L)} = 5mA, R_L = 100\Omega$		3	10	μs
Collector saturation voltage	$V_{CE(sat)}$	$I_{CE(L)} = 1mA, L = 1000 lx^{*1}$		0.2	0.5	V

*1 Measurements were made using a tungsten lamp (color temperature $T = 2856K$) as a light source.

*2 Switching time measurement circuit



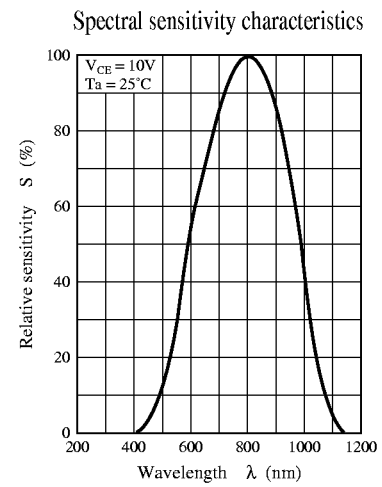
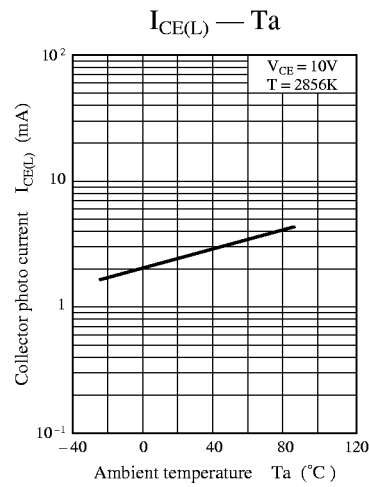
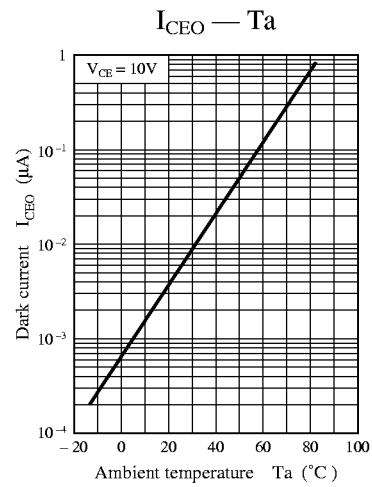
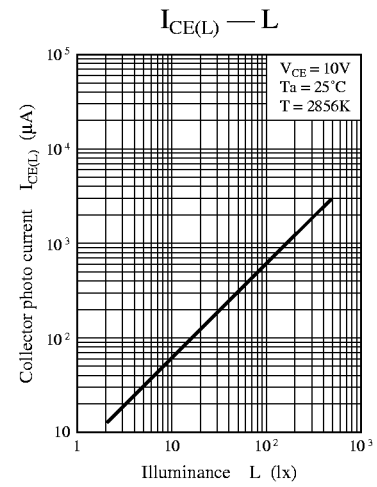
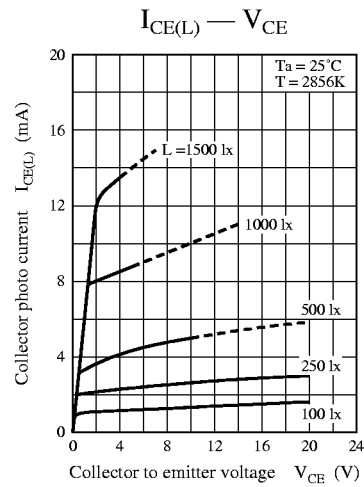
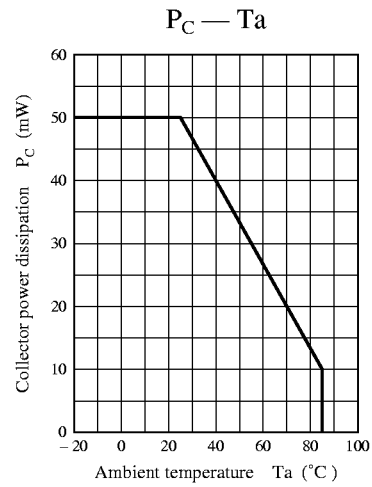
t_d : Delay time

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)

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

Class	Q	R	S
$I_{CE(L)} (\mu A)$	3.0 to 11.0	7.0 to 24.0	>16.0



Directivity characteristics

