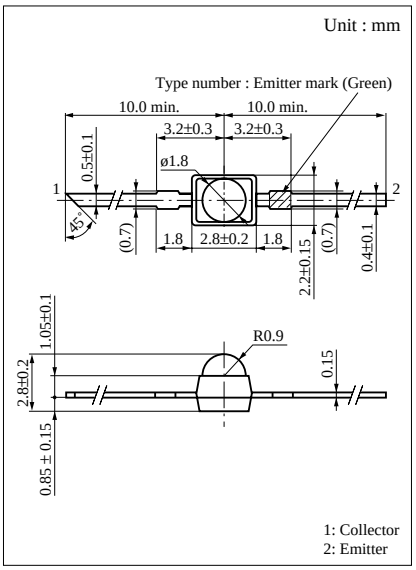
PNZ147 (PN147)

Silicon NPN Phototransistor

For optical control systems



■ Features

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

■ Absolute Maximum Ratings (Ta = 25˚C)

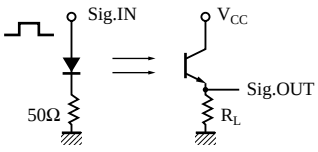
Parameter	Symbol	Ratings	Unit
Collector to emitter voltage	V_{CEO}	20	V
Emitter to collector voltage	V_{ECO}	5	V
Collector current	I_C	20	mA
Collector power dissipation	P_C	50	mW
Operating ambient temperature	T_{opr}	–25 to +85	˚C
Storage temperature	T_{stg}	–30 to +100	˚C

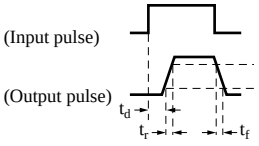
■ Electro-Optical Characteristics (Ta = 25˚C)

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 = 100Ω		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





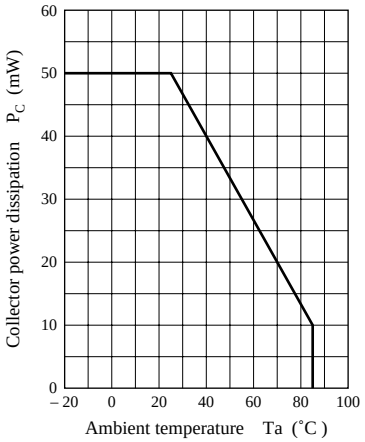
t_d : Delay time
t_r : Rise time (Time required for the collector photo current to increase from 10% to 90% of its final value)
t_f : Fall time (Time required for the collector photo current to decrease from 90% to 10% of its initial value)

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

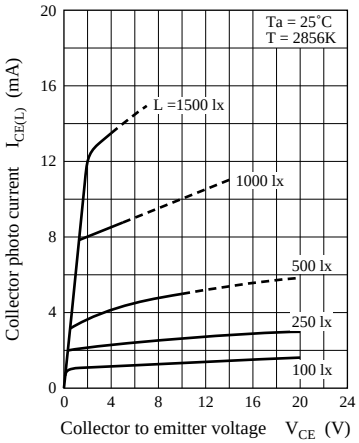
Class	Q	R	S
$I_{CE(L)}$ (µA)	3.0 to 11.0	7.0 to 24.0	>16.0

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

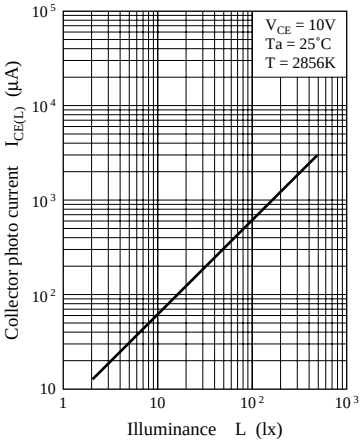
P_C — Ta



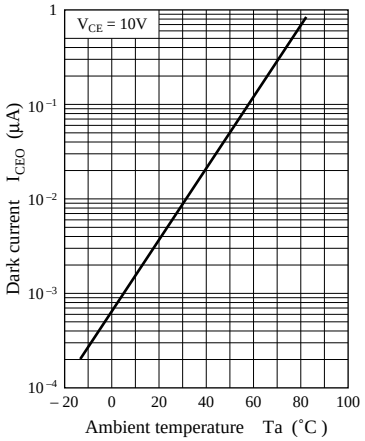
$I_{CE(L)}$ — V_{CE}



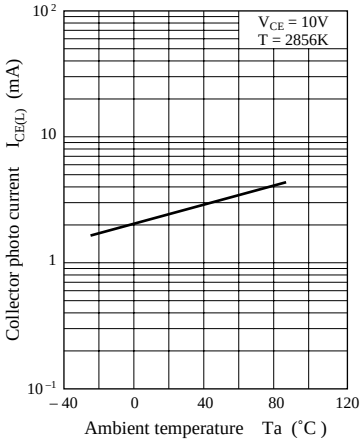
$I_{CE(L)}$ — L



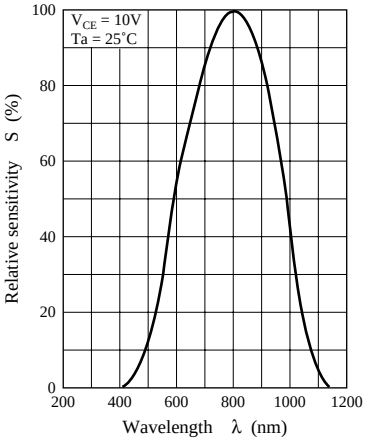
I_{CEO} — Ta



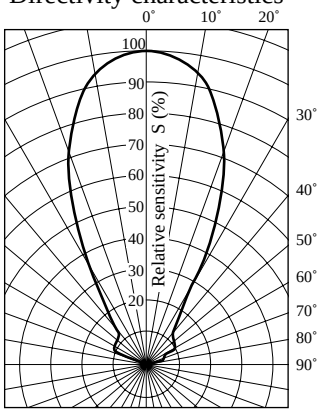
$I_{CE(L)}$ — Ta



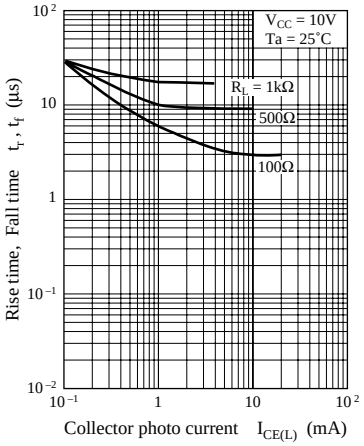
Spectral sensitivity characteristics



Directivity characteristics



t_r , t_f — $I_{CE(L)}$



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