

PNA1401LF, PNZ102F

Silicon NPN Phototransistors

For optical control systems

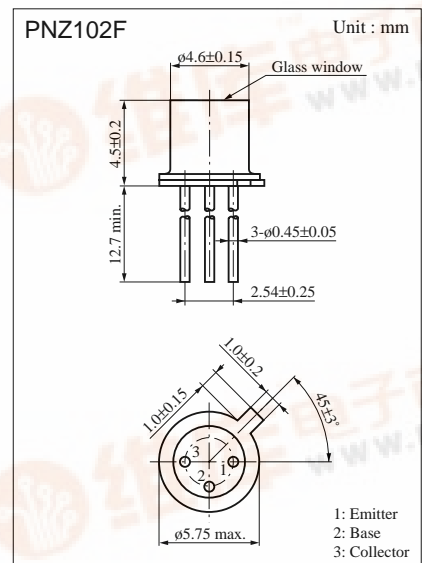
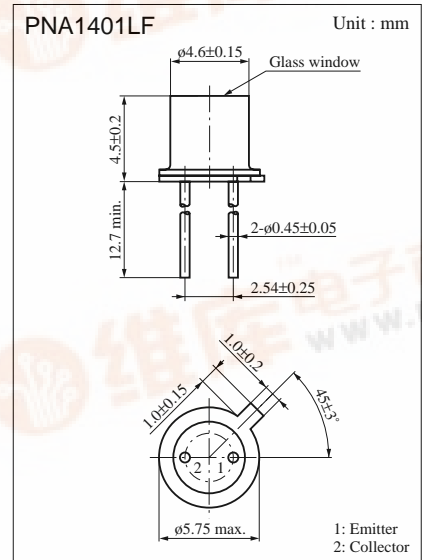
Features

- Flat window design which is suited to optical systems
- Low dark current : $I_{CEO} = 5 \text{ nA}$ (typ.)
- Fast response : $t_r, t_f = 3 \mu\text{s}$ (typ.)
- Wide directional sensitivity
- Base pin for easy circuit design (PNZ102F)

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Rated	Unit
Collector to emitter voltage	V_{CEO}	30	V
Collector to base voltage	V_{CBO}^*	40	V
Emitter to collector voltage	V_{ECO}	5	V
Emitter to base voltage	V_{EBO}^*	5	V
Collector current	I_C	50	mA
Collector power dissipation	P_C	150	mW
Operating ambient temperature	T_{opr}	-25 to +85	$^\circ\text{C}$
Storage temperature	T_{stg}	-30 to +100	$^\circ\text{C}$

* PNZ102F only

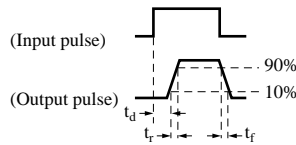
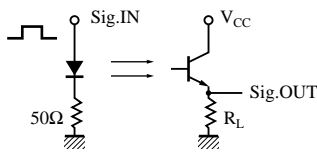


■ Electro-Optical Characteristics (Ta = 25°C)

Parameter	Symbol	Conditions	min	typ	max	Unit	
Dark current	I_{CEO}	$V_{CE} = 10V$		5	300	nA	
Collector photo current	$I_{CE(L)}$	$V_{CE} = 10V, L = 100 \text{ lx}^*1$	0.1	0.3		mA	
Peak sensitivity wave length	λ_P	$V_{CE} = 10V$		800		nm	
Acceptance half angle	θ	Measured from the optical axis to the half power point		40		deg.	
Response time	t_r, t_f^*2	$V_{CC} = 10V, I_{CE(L)} = 5mA, R_L = 100\Omega$		3		μs	
Collector saturation voltage	$V_{CE(sat)}$	$L = 500 \text{ lx}^*1$	PNA1401LF $I_{CE(L)} = 0.1mA$		0.2	0.4	V
			PNZ102F $I_{CE(L)} = 0.1mA$				

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

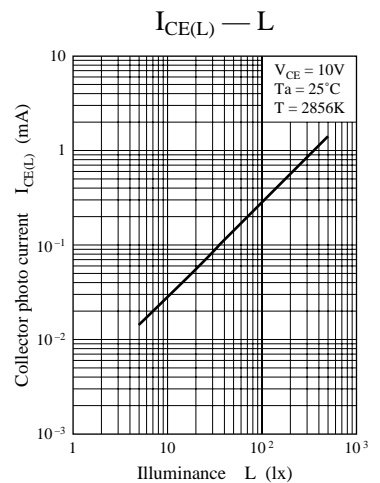
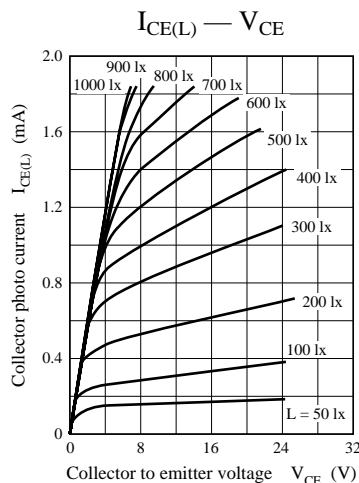
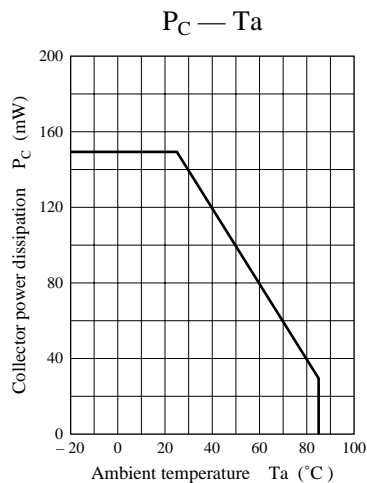
*2 Switching time measurement circuit

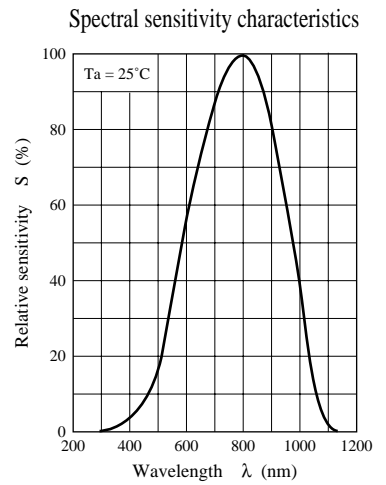
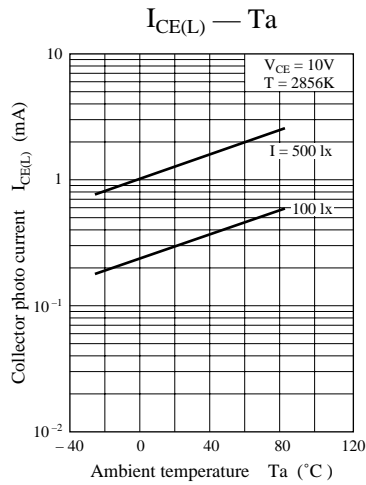
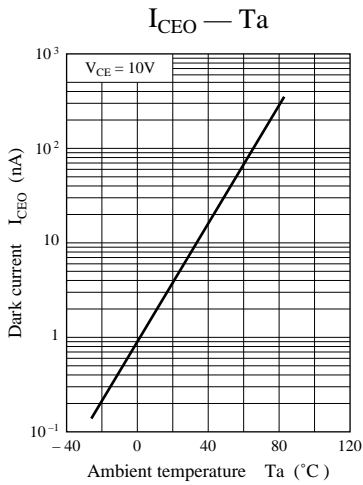


t_d : Delay time

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)





Directivity characteristics

