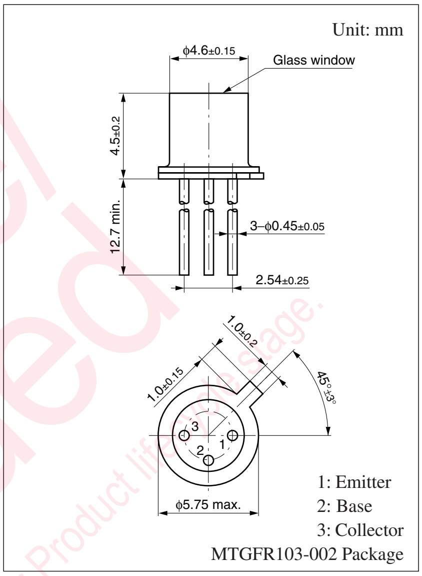
PNZ109F (PN109F)

Silicon planar type



For optical control systems

■ Features

- Flat window design which is suited to optical systems
- Built-in filter to cutoff visible light for reducing ambient light noise
- Peak sensitivity wavelength matched with infrared light emitting devices: λp = 900 nm (typ.)
- Fast response: t_r = 8 μs (typ.)
- Long lifetime, high reliability

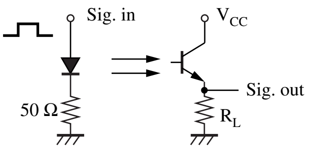
■ Absolute Maximum Ratings T_a = 25°C

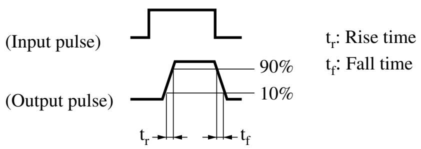
Parameter	Symbol	Rating	Unit
Collector-emitter voltage (Base open)	V_{CEO}	20	V
Collector-base voltage (Emitter open)	V_{CBO}	30	V
Emitter-collector voltage (Base open)	V_{ECO}	3	V
Emitter-base voltage (Collector open)	V_{EBO}	5	V
Collector current	I_C	30	mA
Collector power dissipation	P_C	150	mW
Operating ambient temperature	T_{opr}	−25 to +85	°C
Storage temperature	T_{stg}	−30 to +100	°C

■ Electrical-Optical Characteristics T_a = 25°C ± 3°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Photocurrent *1	$I_{CE(L)}$	V_{CE} = 10 V, L = 100 lx	0.3			mA
Dark current	I_{CEO}	V_{CE} = 10 V		0.05	2.00	μA
Peak emission wavelength	λ_p	V_{CE} = 10 V		900		nm
Half-power angle	θ	The angle from which photocurrent becomes 50%		40		°
Rise time *2	t_r	V_{CC} = 10 V, $I_{CE(L)}$ = 1 mA, R_L = 100 Ω		8		μs
Fall time *2	t_f			9		μs
Collector-emitter saturation voltage *1	$V_{CE(sat)}$	$I_{CE(L)}$ = 1 mA, L = 1 000 lx		0.3	0.6	V

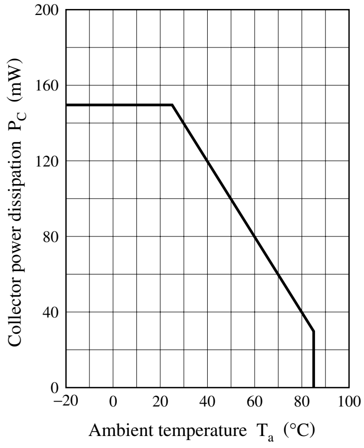
Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.
2. Spectral sensitivity characteristics: Sensitivity for wave length over 400 nm maximum sensitivity ratio is 100%.
3. This device is designed be disregarded radiation.
4. *1: Source: Tungsten (color temperature 2 856 K)
*2: Switching time measurement circuit



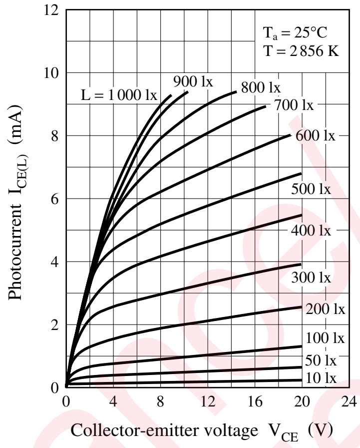


Note) The part number in the parenthesis shows conventional part number.

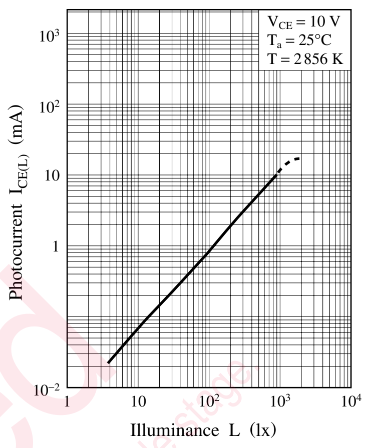
P_C — T_a



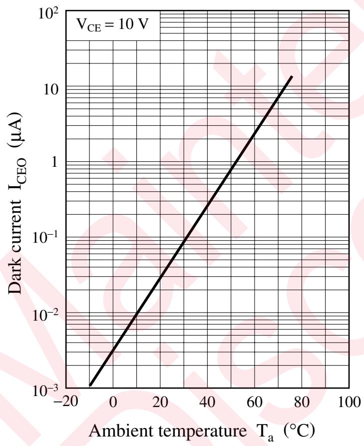
$I_{CE(L)}$ — V_{CE}



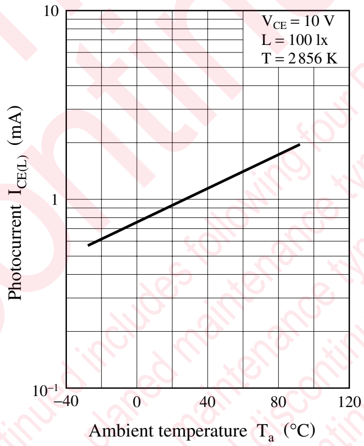
$I_{CE(L)}$ — L



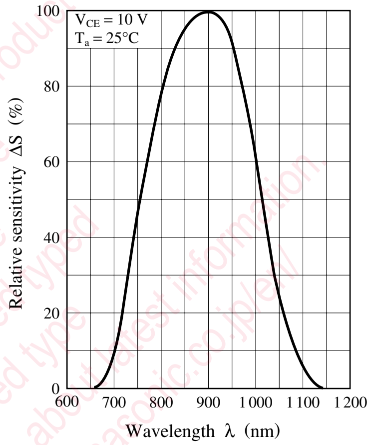
I_{CEO} — T_a



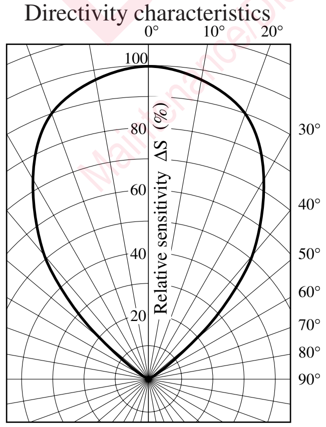
$I_{CE(L)}$ — T_a



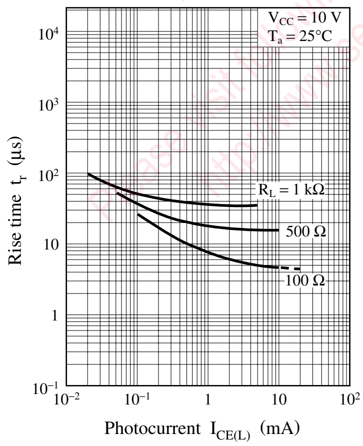
Spectral sensitivity characteristics



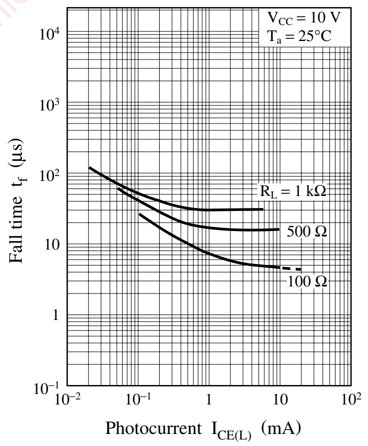
Directivity characteristics



t_r — $I_{CE(L)}$



t_f — $I_{CE(L)}$



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