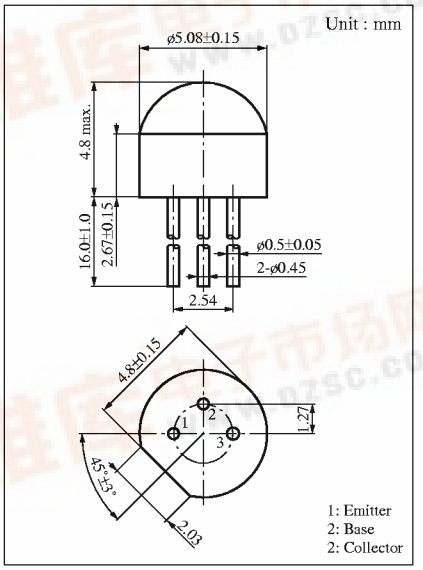
PN111W

Silicon NPN Phototransistor

For optical control systems



Features

- High sensitivity
- Wide spectral responsivity
- Base pin for easy circuit design
- Wide directional sensitivity : θ = 80 deg. (typ.)

Absolute Maximum Ratings (Ta = 25°C)

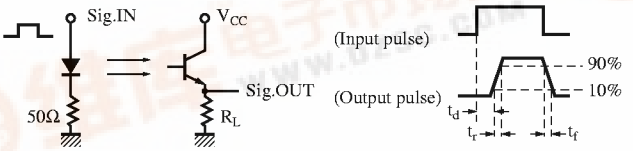
Parameter	Symbol	Ratings	Unit
Collector to emitter voltage	V_{CEO}	20	V
Collector to base voltage	V_{CBO}	30	V
Emitter to collector voltage	V_{ECO}	3	V
Emitter to base voltage	V_{EBO}	5	V
Collector current	I_C	10	mA
Collector power dissipation	P_C	100	mW
Operating ambient temperature	T_{opr}	–25 to +85	°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		0.05	2	μA
Collector photo current	$I_{CE(L)}$	V_{CE} = 10V, L = 500 lx*1	4.5	6		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		80		deg.
Rise time	t_r*2	V_{CC} = 10V, $I_{CE(L)}$ = 5mA		5	15	μs
Fall time	t_f*2	R_L = 100Ω		6	15	μs
Collector saturation voltage	$V_{CE(sat)}$	$I_{CE(L)}$ = 1mA, L = 1000 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



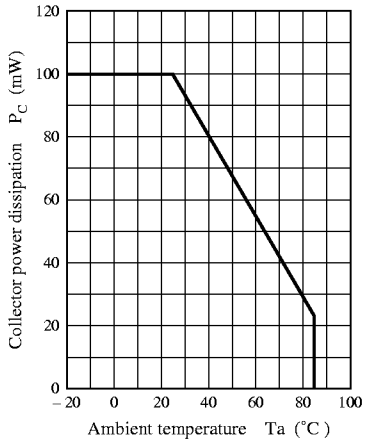
t_d: Delay time

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

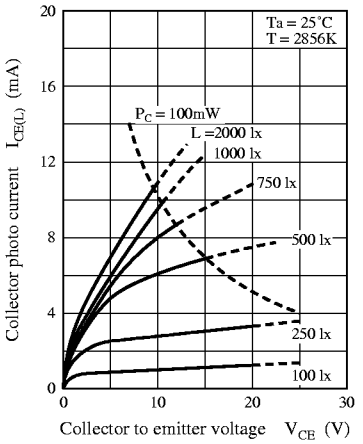
t_f: Fall time (Time required for the collector photo current to decrease from 90% to 10% of its initial value)

Note) Please make a thorough study of the specifications.

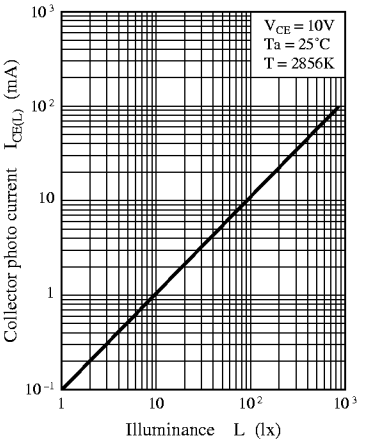
P_C — Ta



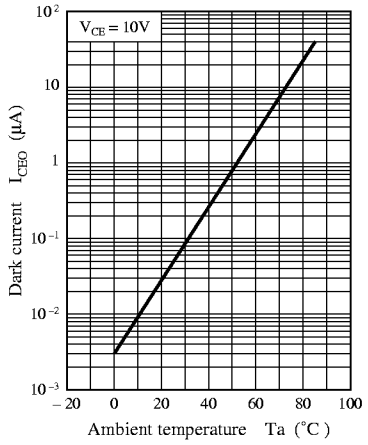
$I_{CE(L)}$ — V_{CE}



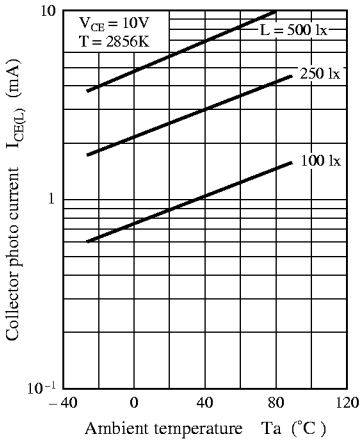
$I_{CE(L)}$ — L



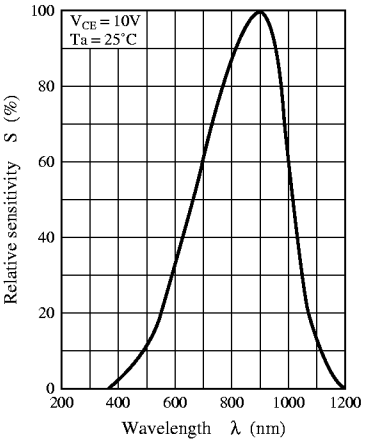
I_{CEO} — Ta



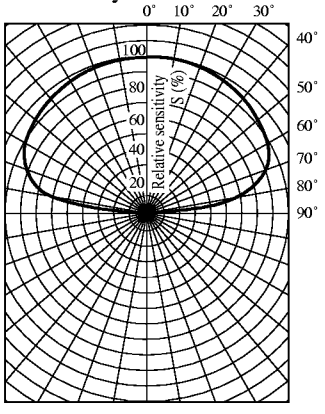
$I_{CE(L)}$ — Ta



Spectral sensitivity characteristics



Directivity characteristics



t_r — $I_{CE(L)}$