PT501/PT510

TO-18 Type Narrow Acceptance Phototransistor

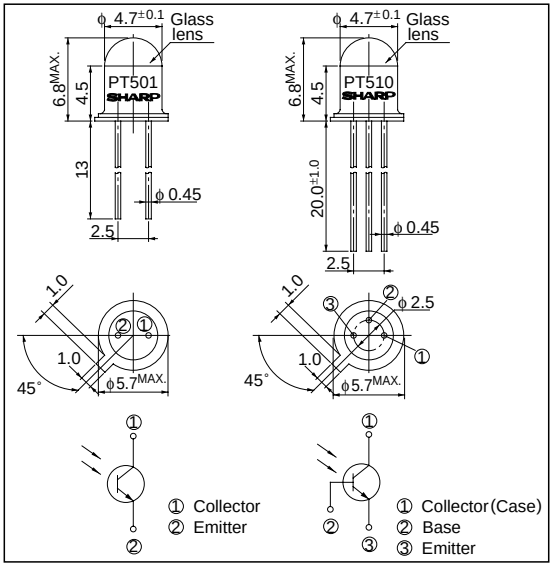
■ Features

1. Narrow acceptance (Δθ : TYP. ± 6˚)
2. TO -18 type standard package
3. With base terminal : **PT510**

■ Applications

1. Optoelectronic switches, optoelectronic counters
2. Smoke detectors
3. Infrared applied systems

■ Outline Dimensions (Unit : mm)



■ Absolute Maximum Ratings (Ta = 25˚C)

Parameter	Symbol	PT501	PT510	Unit
Collector-emitter voltage	V_{CEO}	45	35	V
Emitter-collector voltage	V_{ECO}	6	6	V
Collector-base voltage	V_{CBO}	-	35	V
Emitter-base voltage	V_{EBO}	-	6	V
Collector power dissipation	P_C	75	75	mW
Operating temperature	T_{opr}	- 25 to + 125	- 25 to + 125	˚C
Storage temperature	T_{stg}	- 55 to + 150	- 55 to + 150	˚C
*1 Soldering temperature	T_{sol}	260	260	˚C

*1 For 10 seconds at the position of 1.3mm from the bottom face of can package

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

Parameter		Symbol	Conditions	MIN.	TYP.		MAX.	Unit
*2Collector current		I_C	V_{CE} = 5V, E_e = 10mW/cm²	2.5	**PT501**	10	-	mA
					PT510	20		
Collector dark current		I_{CEO}	V_{CE} = 30V, E_e = 0	-	2 x 10^{-9}		10^{-7}	A
*2Collector-emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 1mA, E_e = 10mW/cm²	-	0.2		-	V
Peak sensitivity wavelength		λ_P		-	800		-	nm
Response time	Rise time	t_r	V_{CE} = 2V, I_C = 2mA, R_L = 100Ω (**PT501**: 1kΩ)	-	**PT501**	10	-	μs
					PT510	2		
	Fall time	t_f		-	**PT501**	10	-	μs
					PT510	3		

*2 E_e : Irradiance by CIE standard light source A (tungsten lamp)

" In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that occur in equipment using any of SHARP's devices, shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device."

*2 Classification Table of Collector Current(I_C)

Model No.	I_C (mA)
PT501A	20 to 80
PT501B	10 to 25
PT501C	2.5 to 15

at V_{CE}= 5V, E_e = 10mW/cm^2, Ta = 25˚C

Fig. 1 Collector Power Dissipation vs. Ambient Temperature

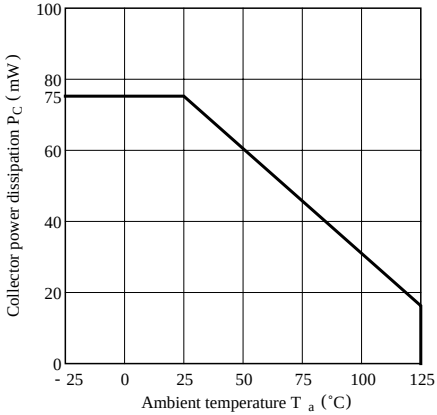


Fig. 2 Collector Dark Current vs. Ambient Temperature

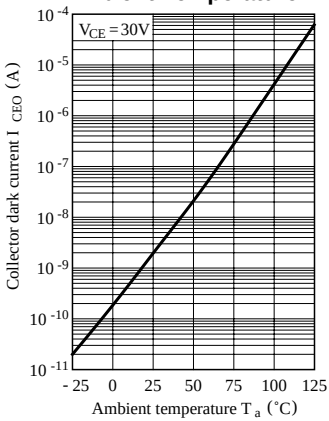


Fig. 3 Relative Collector Current vs. Ambient Temperature

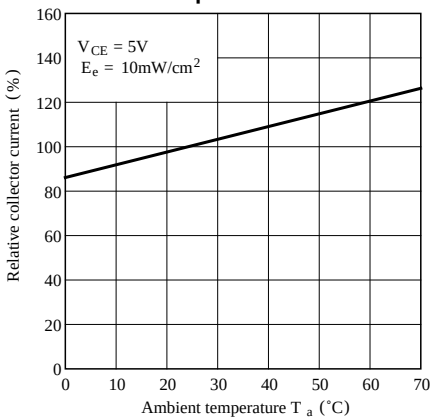


Fig.4-a Collector Current vs. Irradiance (PT501)

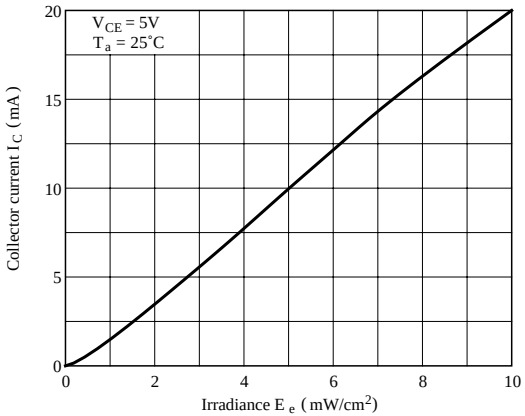


Fig.4-b Collector Current vs. Irradiance (PT510)

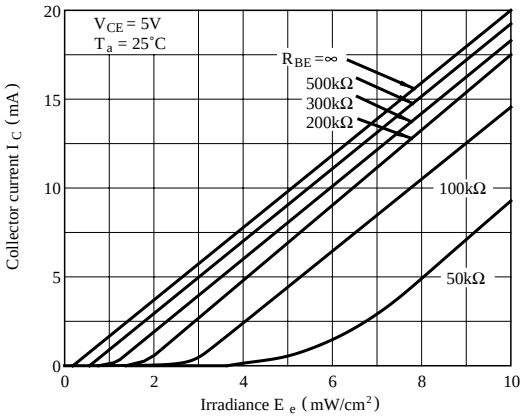


Fig.5-a Collector Current vs. Collector-emitter Voltage (PT501)

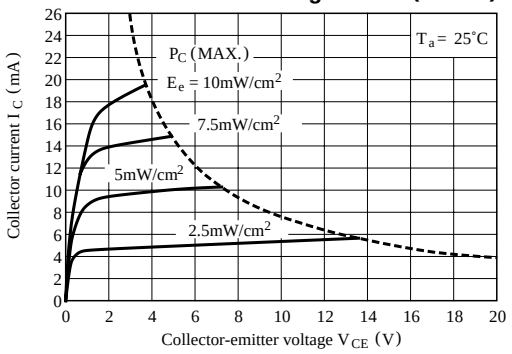


Fig.5-b Collector Current vs. Collector-emitter Voltage (PT510)

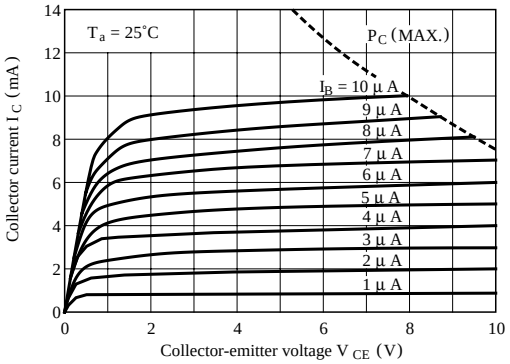


Fig. 6 Spectral Sensitivity

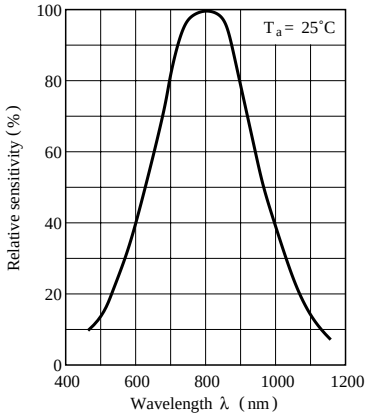


Fig. 7 Response Time vs. Load Resistance

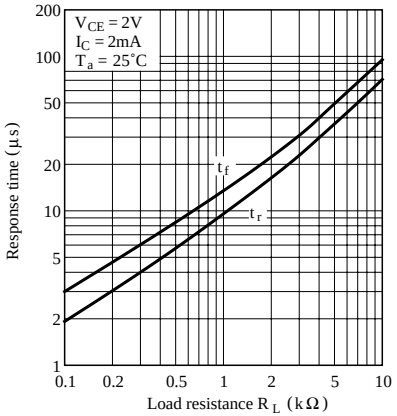
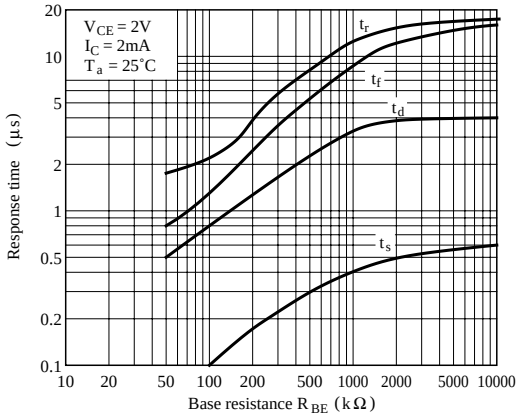
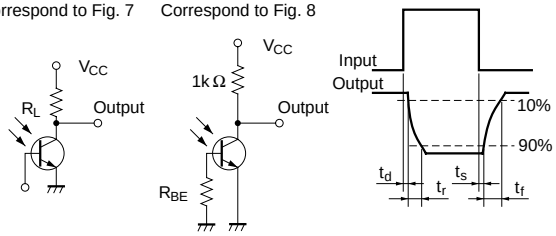


Fig. 8 Response Time vs. Base Resistance (PT510)



Test Circuit for Response Time

Correspond to Fig. 7 Correspond to Fig. 8



(**PT501** has no base terminal.)

Fig. 9 Sensitivity Diagram (T_a = 25°C)

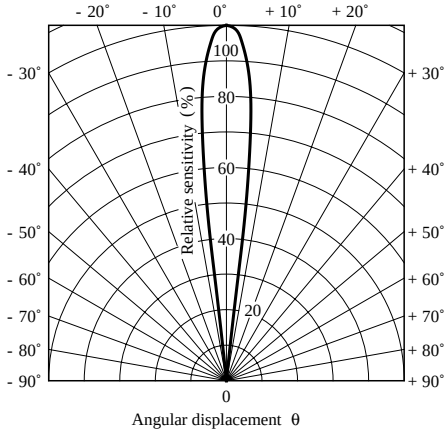
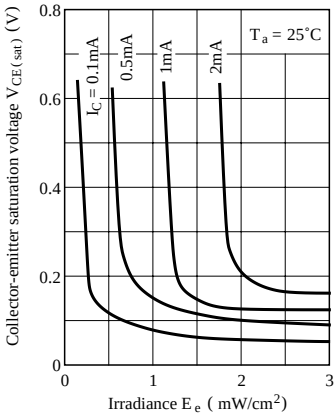


Fig.10 Collector-emitter Saturation Voltage vs. Irradiance



● Please refer to the chapter "Precautions for Use."