PT380/PT380F PT381/PT381F

High Sensitivity, ϕ3mm Resin Mold Type Phototransistor

■ Features

1. High sensitivity
   (I_C : MIN.160μA at E_V = 100lx, **PT380**)
   (I_C : MIN.120μA at E_V = 2lx, **PT381**)
2. Compact ϕ3mm resin mold package
3. Intermediate acceptance (Δθ : TYP. ± 20˚)
4. Visible light cut-off type : **PT380F / PT381F**

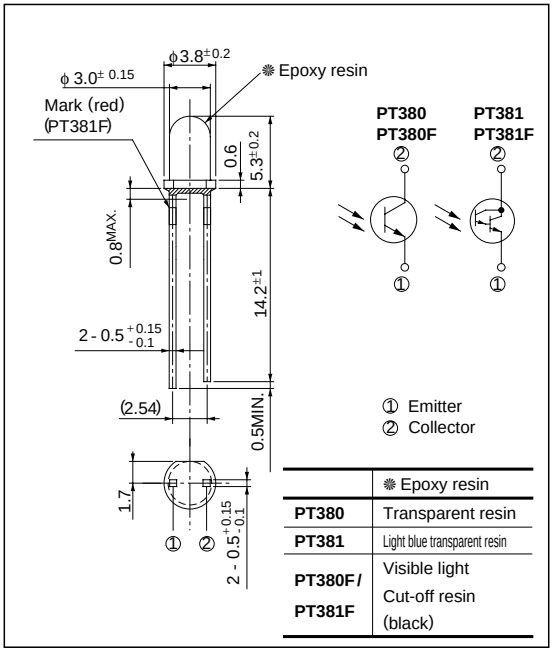
■ Model Line-ups

	Single photo-transistor output	Darlington photo-transistor output
No visible light cut-off filter	**PT380**	**PT381**
Built-in visible light cut-off filter	**PT380F**	**PT381F**

■ Applications

1. Floppy disk drives
2. Optoelectronic switches
3. Infrared applied systems

■ Outline Dimensions (Unit : mm)



	✵ Epoxy resin
PT380	Transparent resin
PT381	Light blue transparent resin
PT380F / PT381F	Visible light Cut-off resin (black)

■ Absolute Maximum Ratings (Ta = 25˚C)

Parameter	Symbol	Rating	Unit
Collector-emitter voltage	V_{CEO}	35	V
Emitter-collector voltage	V_{ECO}	6	V
Collector current	I_C	20	mA
Collector power dissipation	P_C	50	mW
Operating temperature	T_{opr}	- 25 to + 85	˚C
Storage temperature	T_{stg}	- 40 to + 85	˚C
*1 Soldering temperature	T_{sol}	260	˚C

*1 For 3 seconds at the position of 1.4mm from the bottom face of resin package

" 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. "

■ Electro-optical Characteristics

(Ta = 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*2Collector current	**PT380**	I_C	E_V = 100lx	0.16	-	1.17	mA
	PT380F		V_{CE} = 5V	0.095	-	0.90	
	PT381		E_V = 2lx	0.12	-	1.5	
	PT381F		V_{CE} = 10V	0.07	-	1.08	
Collector dark current	**PT380 / PT380F**	I_{CEO}	E_e = 0, V_{CE} = 20V	-	-	0.1	μA
	PT381 / PT381F		E_e = 0, V_{CE} = 10V	-	-	1.0	
*2Collector-emitter saturation voltage	**PT380 / PT380F**	$V_{CE(sat)}$	E_e = 10mW/cm², I_C = 0.5mA	-	0.2	0.4	V
	PT381 / PT381F		E_e = 1mW/cm², I_C = 2.5mA	-	-	1.0	
Collector-emitter breakdown voltage		BV_{CEO}	I_C = 0.1mA E_e = 0	35	-	-	V
Emitter-Collector breakdown voltage		BV_{ECO}	I_C = 0.01mA E_e = 0	6	-	-	V
Peak sensitivity wavelength	**PT380 / PT381**	λ_P	-	-	800	-	nm
	PT380F / PT381F			-	860	-	
Response time: Rise time	**PT380 / PT380F**	t_r	V_{CE} = 20V, I_C = 1mA, R_L = 1kΩ	-	10	40	μs
	PT381 / PT381F		V_{CE} = 2V, I_C = 10mA, R_L = 100Ω	-	100	400	
Response time: Fall time	**PT380 / PT380F**	t_f	V_{CE} = 20V, I_C = 1mA, R_L = 1kΩ	-	8	35	
	PT381 / PT381F		V_{CE} = 2V, I_C = 10mA, R_L = 100Ω	-	100	400	
Half intensity angle		Δθ	-	-	± 20	-	°

*2 E_V, E_e : Illuminance, irradiance by CIE standard light source A (tungsten lamp)

Fig. 1 Collector Power Dissipation vs. Ambient Temperature

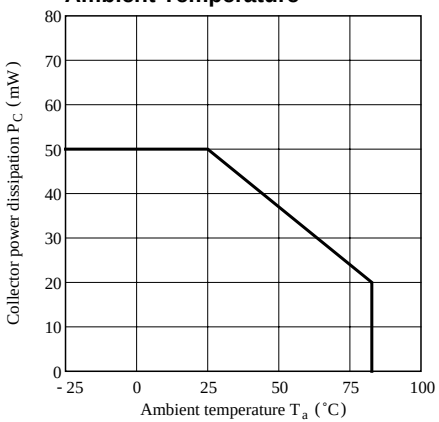


Fig. 2-a Collector Dark Current vs. Ambient Temperature (PT380/PT380F)

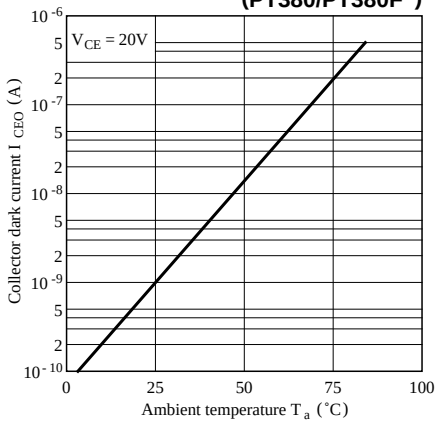


Fig. 2-b Collector Dark Current vs. Ambient Temperature (PT381/381F)

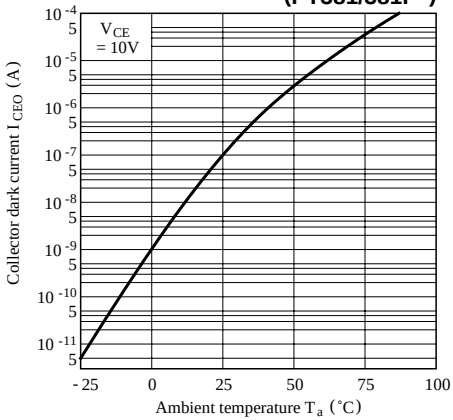


Fig. 3-a Relative Collector Current vs. Ambient Temperature (PT380/PT380F)

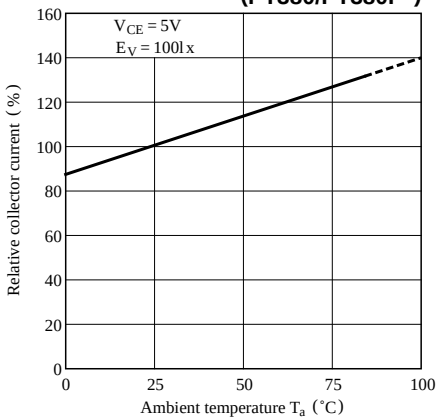


Fig. 3-b Relative Collector Current vs. Ambient Temperature (PT381/PT381F)

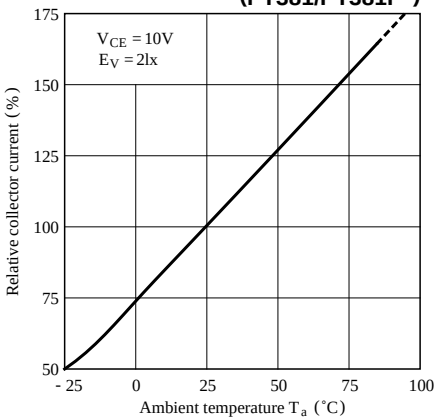


Fig. 4-a Collector Current vs. Irradiance (PT380/380F)

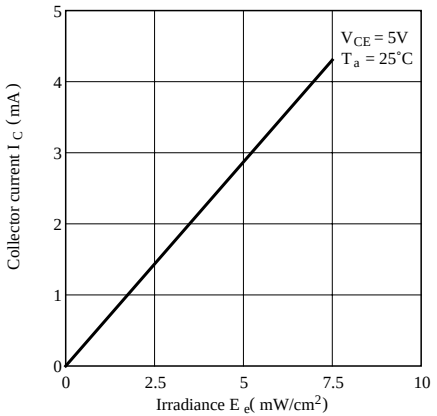


Fig. 4-b Collector Current vs. Irradiance (PT381/PT381F)

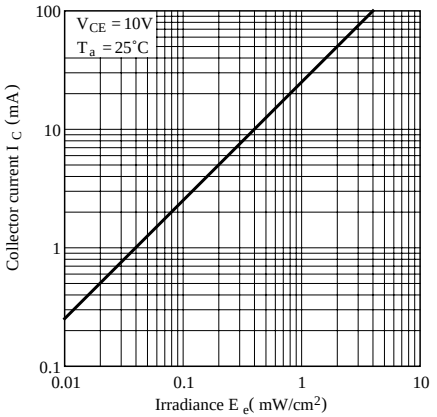


Fig. 5-a Collector Current vs. Collector-emitter Voltage (PT380/380F)

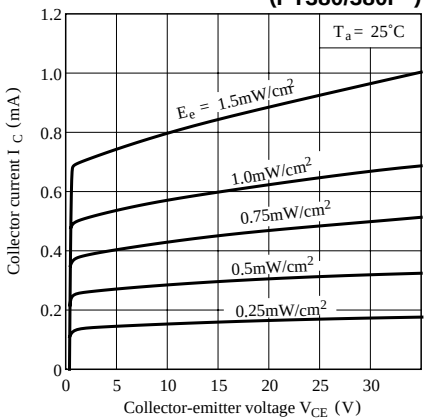


Fig. 5-b Collector Current vs. Collector-emitter Voltage (PT381/381F)

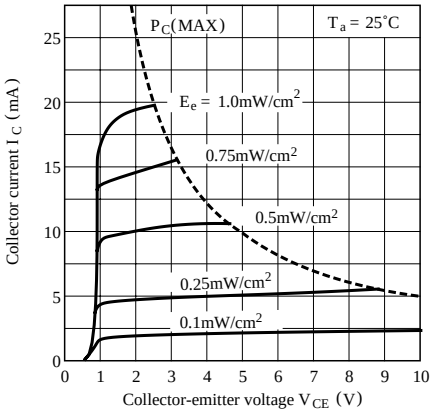


Fig. 6 Spectral Sensitivity

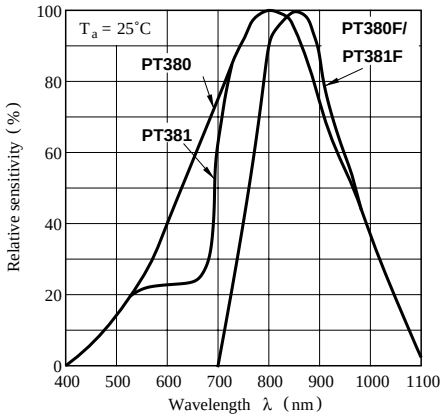
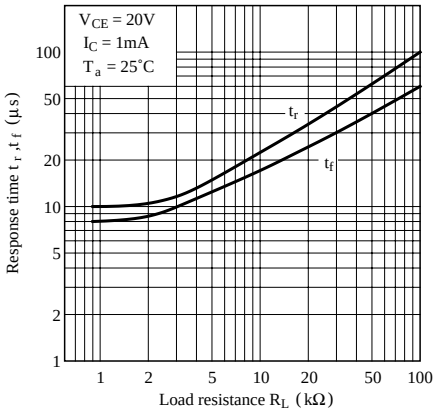


Fig. 7-a Response Time vs. Load Resistance (PT380/PT380F)



Test Circuit for Response Time

(PT380/PT380F)

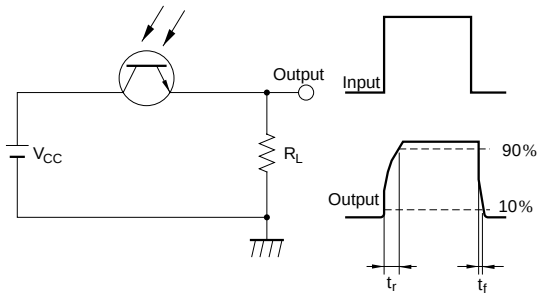
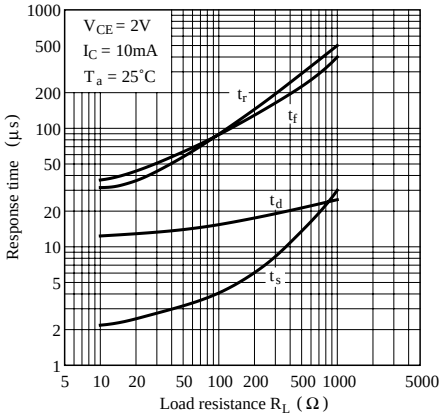


Fig. 7-b Response Time vs. Load Resistance (PT381/381F)



Test Circuit for Response Time

(PT381/PT381F)

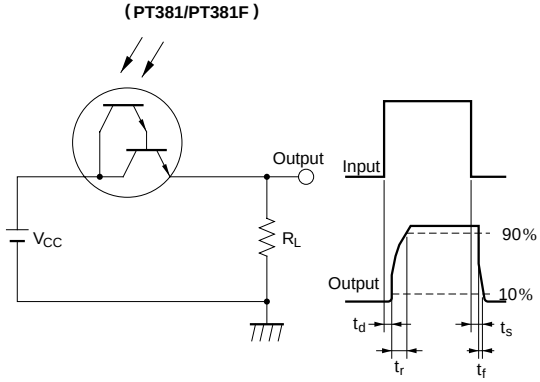


Fig. 8-a Collector-emitter Saturation Voltage vs. Irradiance (PT380/380F)

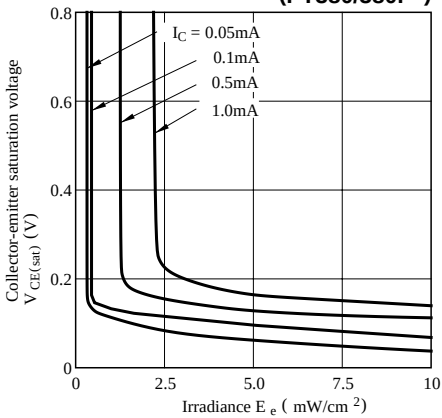


Fig. 8-b Collector-emitter Saturation Voltage vs. Irradiance (PT381/381F)

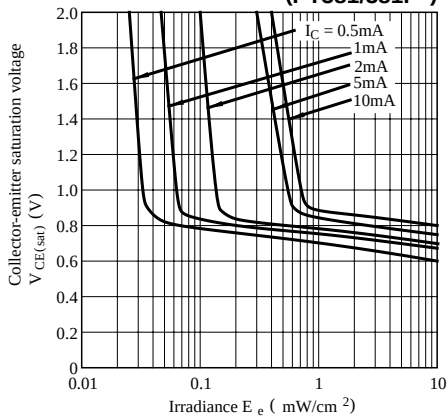


Fig. 9 Sensitivity Diagram (T_a= 25˚C)

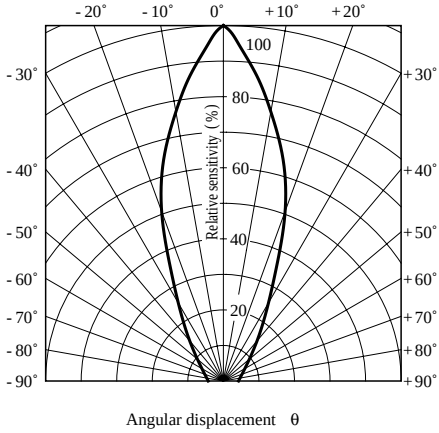
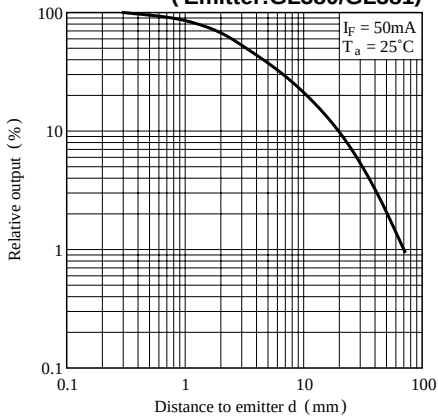


Fig.10 Relative Collector Current vs. Distance to Emitter (Emitter:GL380/GL381)



Please refer to the chapter " Precautions for Use."