

# PT380/PT380F PT381/PT381F

High Sensitivity,  $\phi$  3mm Resin Mold Type  
Phototransistor

## ■ Features

- High sensitivity  
( $I_C$  : MIN.160 $\mu$ A at  $E_V = 100lx$ , **PT380**)  
( $I_C$  : MIN.120 $\mu$ A at  $E_V = 2lx$ , **PT381**)
- Compact  $\phi$  3mm resin mold package
- Intermediate acceptance ( $\Delta\theta$  : TYP.  $\pm 20^\circ$ )
- Visible light cut-off type : **PT380F/PT381F**

## ■ Model Line-ups

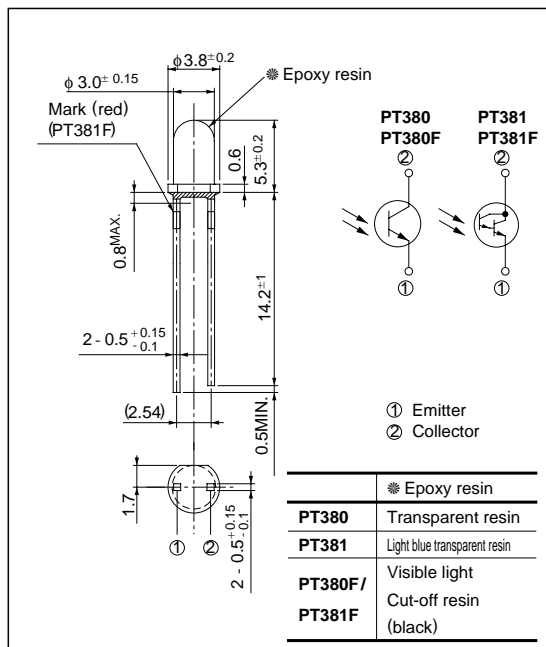
	Single photo-transistor output	Darlington photo-transistor output
No visible light cut-off filter	<b>PT380</b>	<b>PT381</b>
Built-in visible light cut-off filter	<b>PT380F</b>	<b>PT381F</b>

## ■ Applications

- Floppy disk drives
- Optoelectronic switches
- Infrared applied systems

## ■ Outline Dimensions

(Unit : mm)



## ■ Absolute Maximum Ratings

( $T_a = 25^\circ C$ )

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	$^\circ C$
Storage temperature	$T_{stg}$	- 40 to + 85	$^\circ C$
*1 Soldering temperature	$T_{sol}$	260	$^\circ C$

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

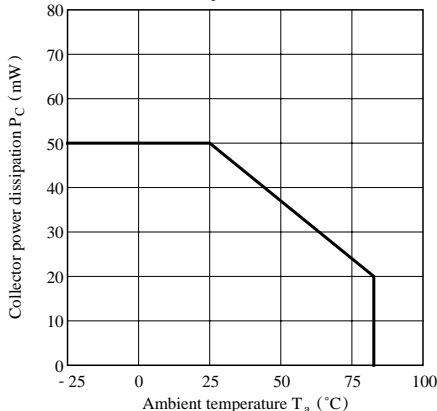
**■ Electro-optical Characteristics**

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

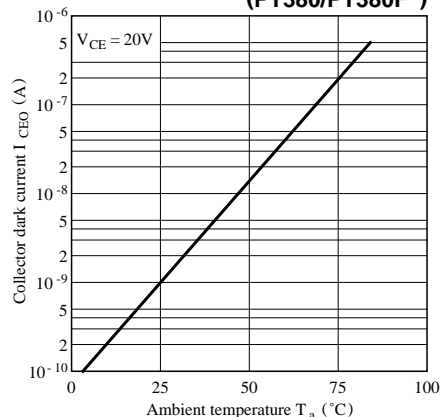
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*2Collector current	<b>PT380</b>	$I_C$	$E_v = 100l_x$	0.16	-	1.17	mA
	<b>PT380F</b>		$V_{CE} = 5V$	0.095	-	0.90	
	<b>PT381</b>		$E_v = 2l_x$	0.12	-	1.5	
	<b>PT381F</b>		$V_{CE} = 10V$	0.07	-	1.08	
Collector dark current	<b>PT380/PT380F</b>	$I_{CEO}$	$E_e = 0, V_{CE} = 20V$	-	-	0.1	$\mu\text{A}$
	<b>PT381/PT381F</b>		$E_e = 0, V_{CE} = 10V$	-	-	1.0	
*2Collector-emitter saturation voltage	<b>PT380/PT380F</b>	$V_{CE(sat)}$	$E_e = 10\text{mW}/\text{cm}^2, I_C = 0.5\text{mA}$	-	0.2	0.4	V
	<b>PT381/PT381F</b>		$E_e = 1\text{mW}/\text{cm}^2, I_C = 2.5\text{mA}$	-	-	1.0	
Collector-emitter breakdown voltage		$BV_{CEO}$	$I_C = 0.1\text{mA}$ $E_e = 0$	35	-	-	V
Emitter-Collector breakdown voltage		$BV_{ECO}$	$I_C = 0.01\text{mA}$ $E_e = 0$	6	-	-	V
Peak sensitivity wavelength	<b>PT380/PT381</b>	$\lambda_P$	-	-	800	-	nm
	<b>PT380F/PT381F</b>			-	860	-	
Response time	Rise time	$t_r$	$V_{CE} = 20V, I_C = 1\text{mA}, R_L = 1\text{k}\Omega$	-	10	40	$\mu\text{s}$
			$V_{CE} = 2V, I_C = 10\text{mA}, R_L = 100\Omega$	-	100	400	
	Fall time	$t_f$	$V_{CE} = 20V, I_C = 1\text{mA}, R_L = 1\text{k}\Omega$	-	8	35	
			$V_{CE} = 2V, I_C = 10\text{mA}, R_L = 100\Omega$	-	100	400	
Half intensity angle		$\Delta\theta$	-	-	$\pm 20$	-	$^\circ$

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

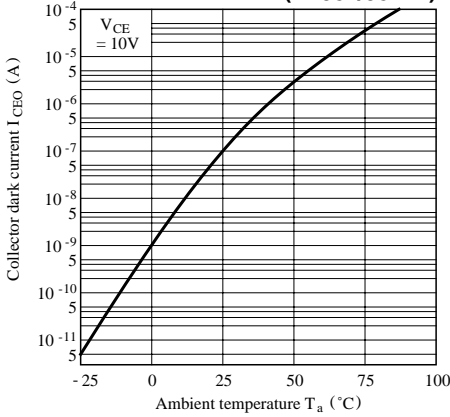
**Fig. 1 Collector Power Dissipation vs. Ambient Temperature**



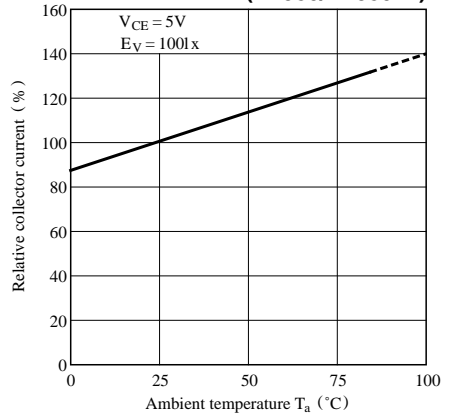
**Fig. 2-a Collector Dark Current vs. Ambient Temperature (PT380/PT380F)**



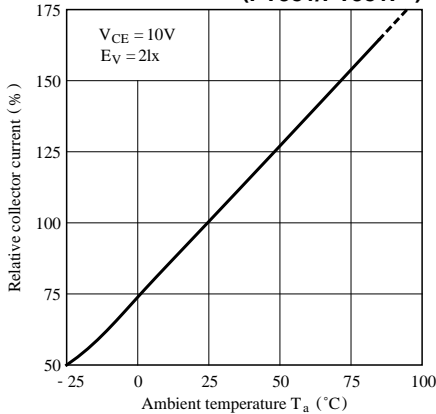
**Fig. 2-b Collector Dark Current vs. Ambient Temperature (PT381/381F)**



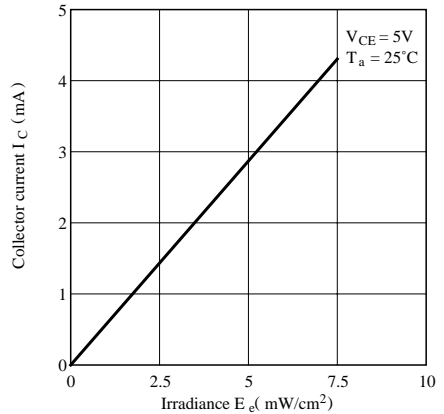
**Fig. 3-a Relative Collector Current vs. Ambient Temperature (PT380/PT380F)**



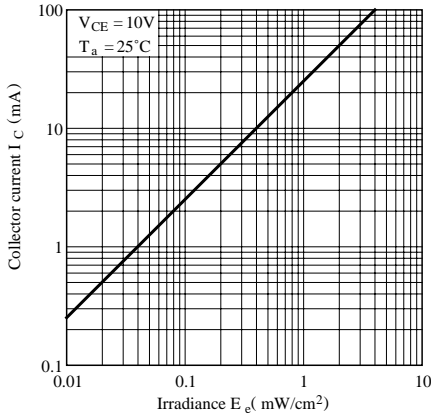
**Fig. 3-b Relative Collector Current vs. Ambient Temperature (PT381/PT381F)**



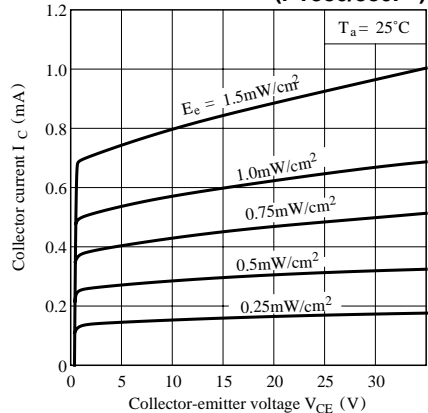
**Fig. 4-a Collector Current vs. Irradiance (PT380/380F)**



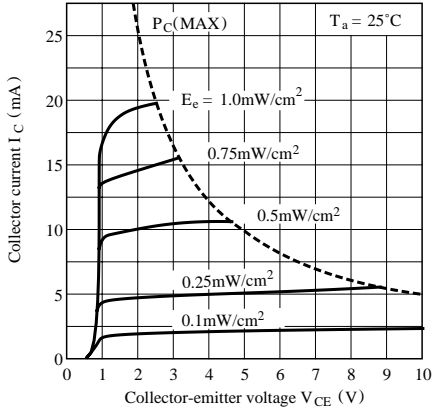
**Fig. 4-b Collector Current vs. Irradiance (PT381/PT381F)**



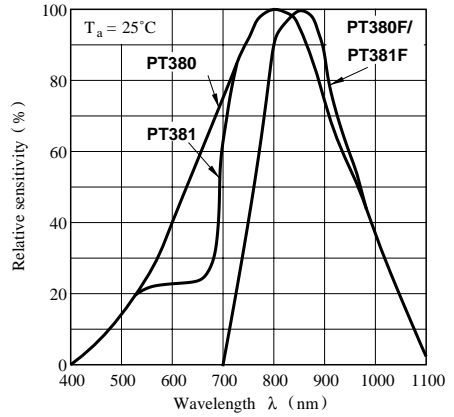
**Fig. 5-a Collector Current vs. Collector-emitter Voltage (PT380/380F)**



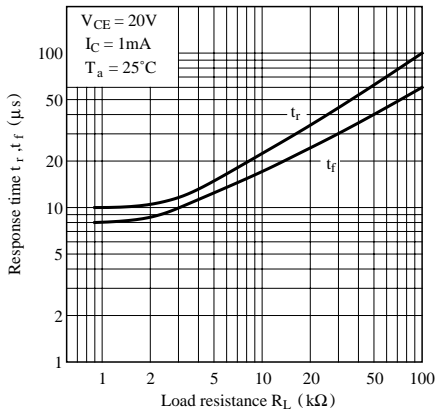
**Fig. 5-b Collector Current vs. Collector-emitter Voltage (PT381/381F)**



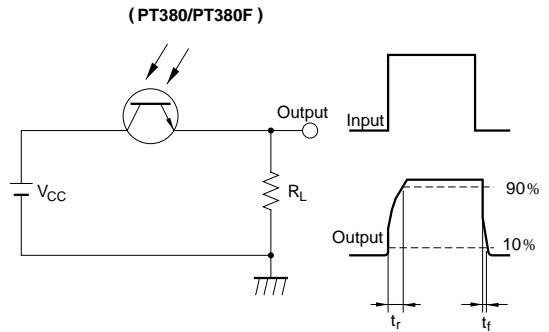
**Fig. 6 Spectral Sensitivity**



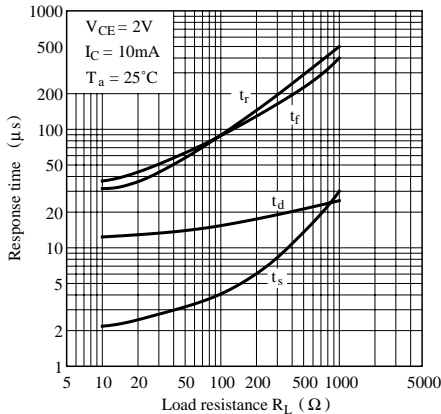
**Fig. 7-a Response Time vs. Load Resistance (PT380/PT380F)**



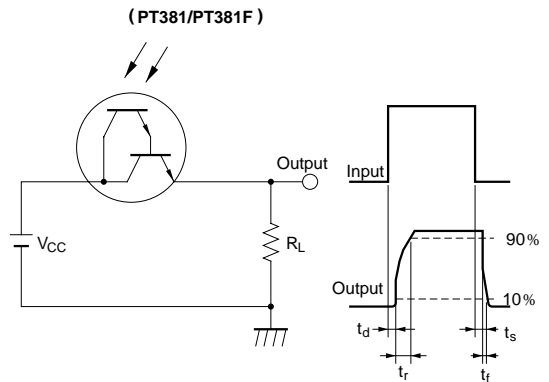
**Test Circuit for Response Time**



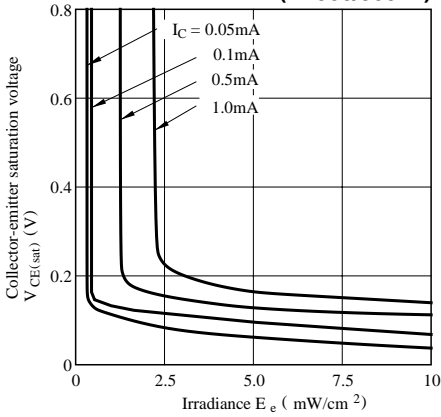
**Fig. 7-b Response Time vs. Load Resistance (PT381/381F)**



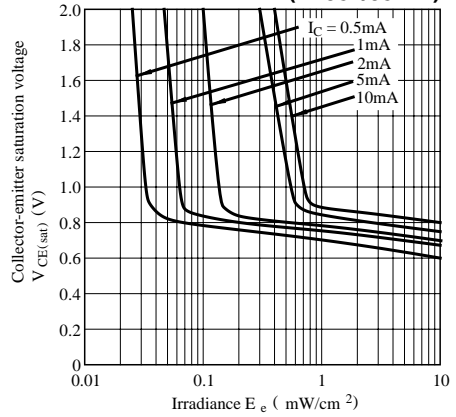
**Test Circuit for Response Time**



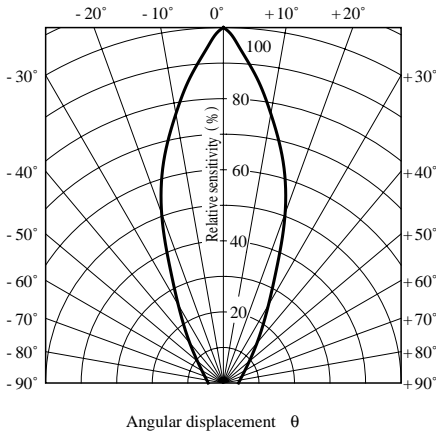
**Fig. 8-a Collector-emitter Saturation Voltage vs. Irradiance (PT380/380F )**



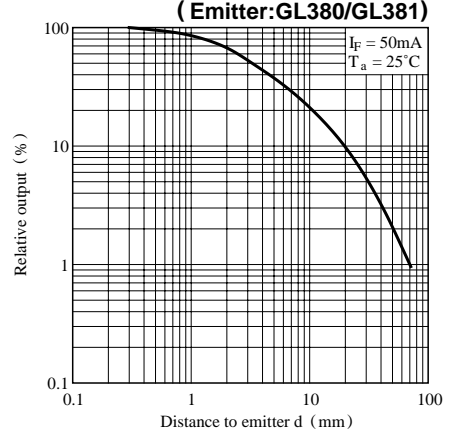
**Fig. 8-b Collector-emitter Saturation Voltage vs. Irradiance (PT381/381F )**



**Fig. 9 Sensitivity Diagram (T<sub>a</sub> = 25°C)**



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



Please refer to the chapter “Precautions for Use.”

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