GL380/GL381

High Output, ϕ 3mm Resin Mold Type Infrared Emitting Diode

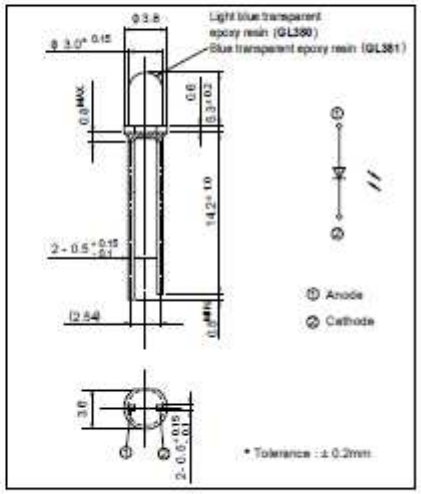
■ Features

1. High output
   (I_E : MIN. 4.5mW/sr at I_F= 50mA, **GL380**)
   (I_E : MIN. 8.5mW/sr at I_F= 50mA, **GL381**)
2. Compact ϕ 3mm resin mold package
3. Narrow beam angle(Δθ : TYP. ± 13°)

■ Applications

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

■ Outline Dimensions (Unit : mm)



■ Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Rating	Unit
Forward current	I_F	60	mA
*1Peak forward current	I_{FM}	1	A
Reverse voltage	V_R	6	V
Power dissipation	P	150	mW
Operating temperature	T_{opr}	- 25 to + 85	°C
Storage temperature	T_{stg}	- 40 to + 85	°C
*2Soldering temperature	T_{sol}	260	°C

*1 Pulse width<=100μs, Duty ratio = 0.01
*2 For 3 seconds at the position of 2.6mm from the bottom face of resin package

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

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Forward voltage		V_F	I_F = 50mA	-	1.3	1.5	V
Peak forward voltage		V_{FM}	I_{FM} = 0.5A	-	2.2	3.5	V
Reverse current		I_R	V_R = 3V	-	-	10	μA
*3Radiant intensity	GL380	I_E	I_F = 50mA	4.5	11	-	mW/sr
	GL381			8.5	20	-	
Peak emission wavelength		λ_P	I_F = 5mA	-	950	-	nm
Half intensity wavelength		Δλ	I_F = 5mA	-	45	-	nm
Terminal capacitance		C_t	V_R = 0, f= 1MHz	-	70	-	pF
Response frequency		f_C		-	300	-	kHz
Half intensity angle		Δθ	I_F = 20mA	-	± 13	-	°

*3 I E : Value obtained by converting the value in power of radiant fluxes at the solid angle of 0.01 sr(steradian) the direction of mechanical axis of the the lens portion into 1 sr of all those emitted from the light emitting diode.

PT380/PT380F PT381/PT381F

High Sensitivity, ϕ 3mm 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**

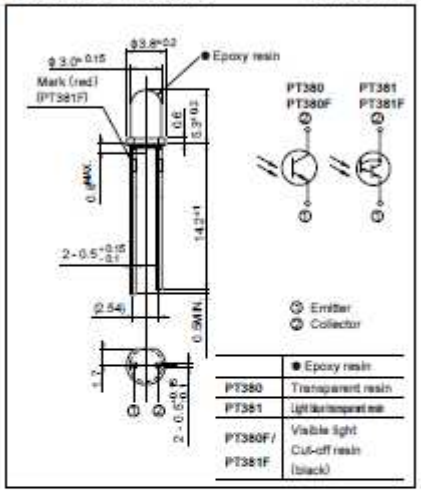
■ Model Line-ups

	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)



■ 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

Fig. 1 Forward Current vs. Ambient Temperature

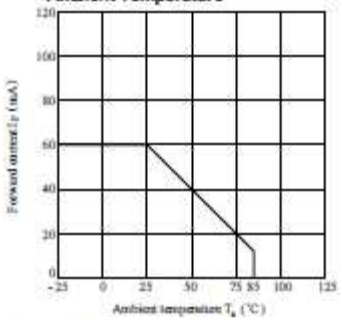


Fig. 2 Peak Forward Current vs. Duty Ratio

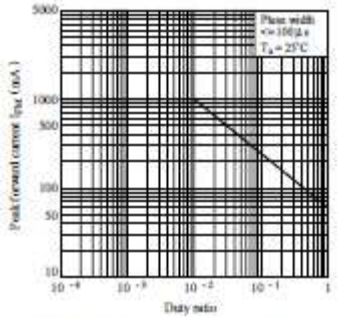


Fig. 3 Spectral Distribution

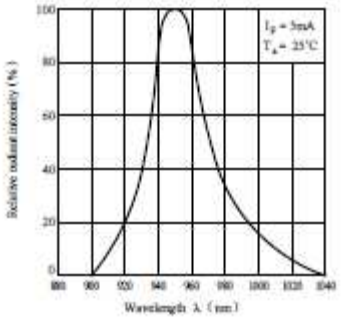


Fig. 4 Peak Emission Wavelength vs. Ambient Temperature

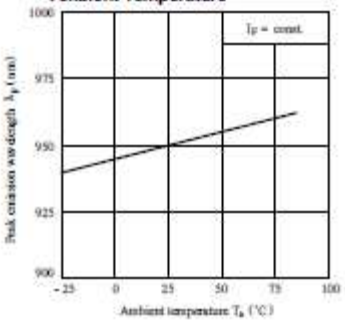


Fig. 5 Forward Current vs. Forward Voltage

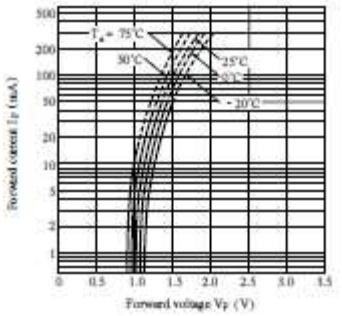
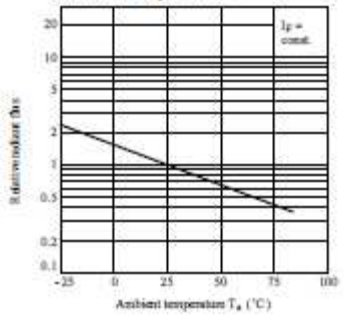


Fig. 6 Relative Radiant Flux vs. Ambient Temperature



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

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
*2 Collector current	PT380	I_C	E_V = 100lx, V_{CE} = 5V	0.16	-	1.17	mA
	PT380F			0.095	-	0.90	
	PT381		E_V = 2lx, V_{CE} = 10V	0.12	-	1.5	
	PT381F			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	
*2 Collector-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	
(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

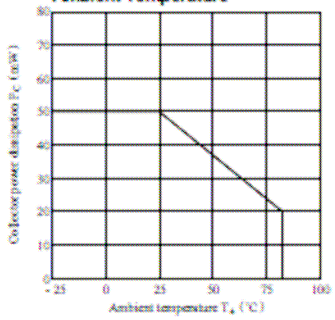


Fig. 2-a Collector Dark Current vs. Ambient Temperature (PT380/PT380F)

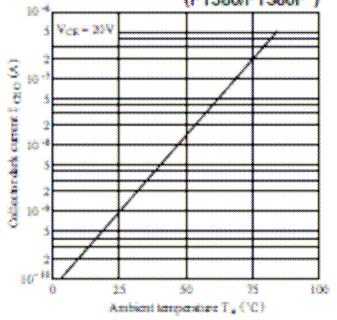


Fig. 7 Radiant Intensity vs. Forward Current

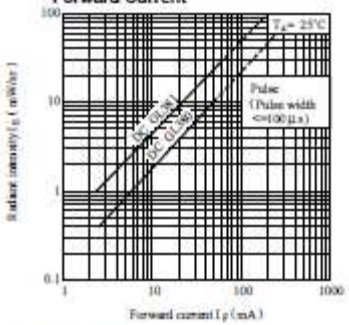


Fig. 8 Relative Collector Current vs. Distance (Detector : PT380 / PT381)

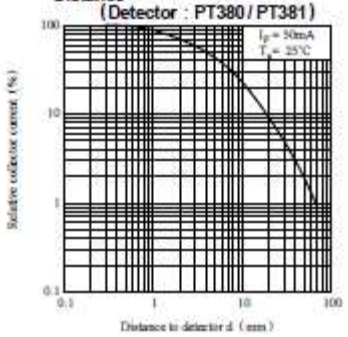
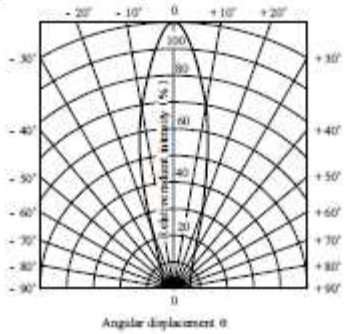


Fig. 9 Radiation Diagram



● Please refer to the chapter "Precautions for Use"

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

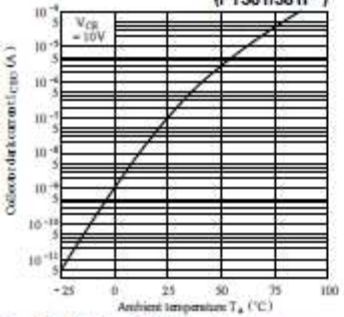


Fig. 3-a Relative Collector Current vs. Ambient Temperature (PT380/PT380F)

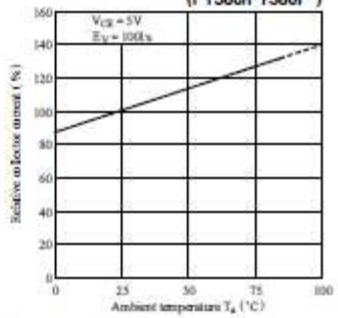


Fig. 3-b Relative Collector Current vs. Ambient Temperature (PT381/PT381F)

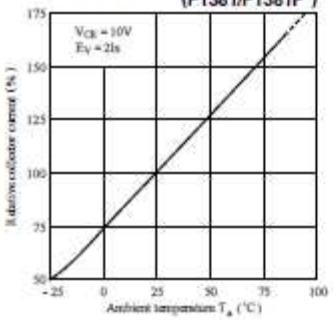


Fig. 4-a Collector Current vs. Irradiance (PT380/380F)

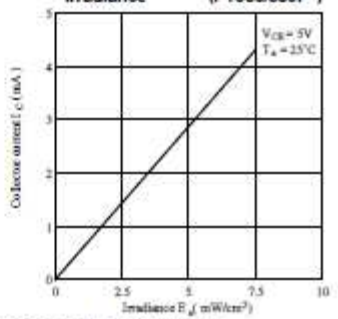


Fig. 4-b Collector Current vs. Irradiance (PT381/PT381F)

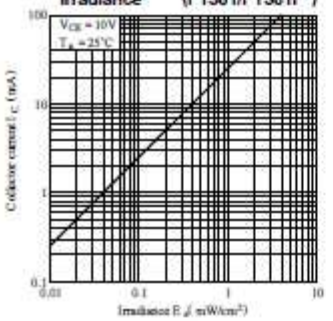


Fig. 5-a Collector Current vs. Collector-emitter Voltage (PT380/380F)

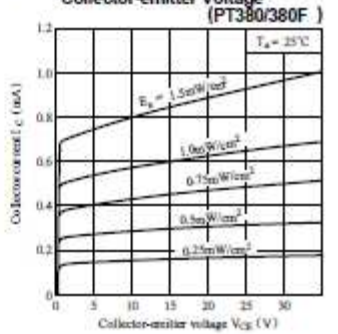


Fig. 5-b Collector Current vs. Collector-emitter Voltage (PT381/381F)

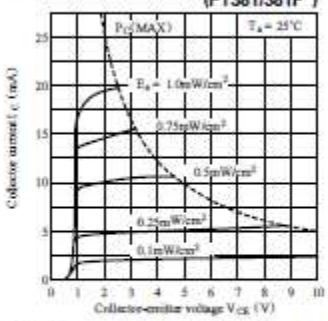


Fig. 6 Spectral Sensitivity

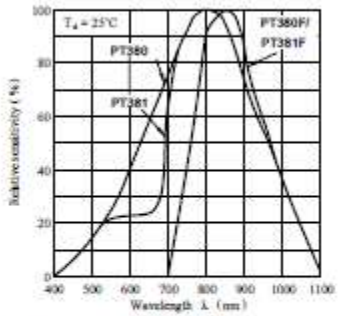
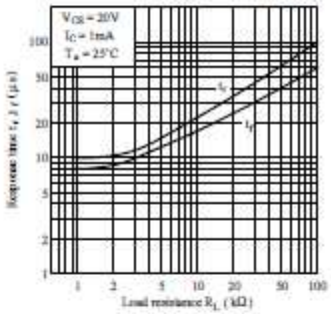


Fig. 7-a Response Time vs. Load Resistance (PT380/PT380F)



Test Circuit for Response Time

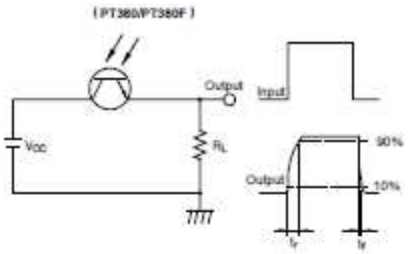
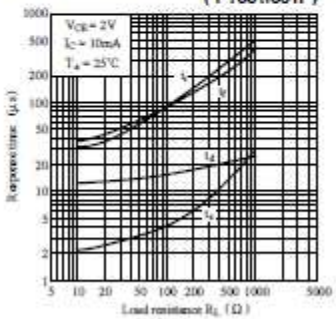


Fig. 7-b Response Time vs. Load Resistance (PT381/381F)



Test Circuit for Response Time

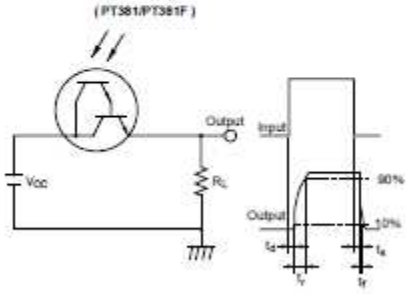


Fig. 8-a Collector-emitter Saturation Voltage vs. Irradiance (PT380/380F)

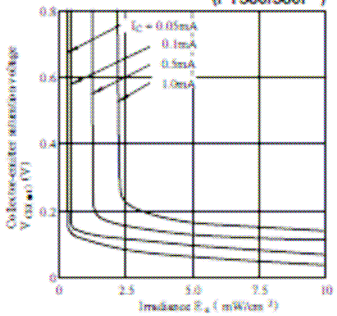


Fig. 8-b Collector-emitter Saturation Voltage vs. Irradiance (PT381/381F)

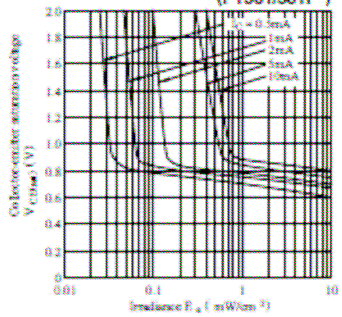


Fig. 9 Sensitivity Diagram (T_a= 25°C)

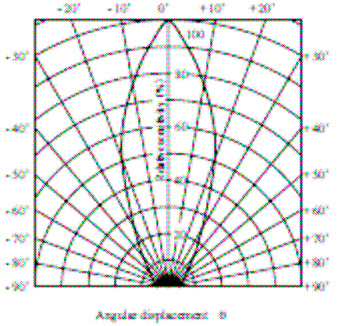
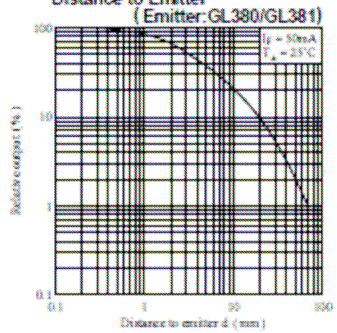


Fig.10 Relative Collector Current vs. Distance to Emitter (Emitter:GL380/GL381)



Please refer to the chapter "Precautions for Use."