

# GP1S01/GP1S01F High Speed Photointerrupter

## ■ Features

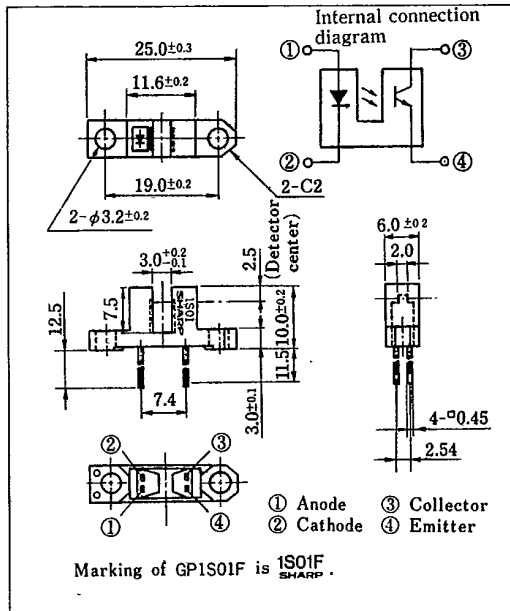
1. High speed response ( $t_r$  : TYP.  $3\mu s$  at  $R_L = 100\Omega$ )
2. High current transfer ratio  
 GP1S01 CTR : MIN. 10%  
 GP1S01F CTR : MIN. 8% } at  $I_F = 20mA$
3. Visible light cut-off type : GP1S01F

## ■ Applications

1. Copiers, printers, facsimiles
2. Record players, cassette decks
3. Speed warning device in automobile
4. Optoelectronic switches, optoelectronic counters

## ■ Outline Dimensions

(Unit : mm)



## ■ Absolute Maximum Ratings

( $T_a = 25^\circ C$ )

	Parameter	Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	*1 Peak forward current	$I_{FM}$	1	A
	Reverse voltage	$V_R$	6	V
	Power dissipation	P	75	mW
Output	Collector-emitter voltage	$V_{CEO}$	35	V
	Emitter-collector voltage	$V_{ECO}$	6	V
	Collector current	$I_C$	20	mA
	Collector power dissipation	$P_C$	75	mW
	Operating temperature	$T_{opr}$	-25 ~ +85	$^\circ C$
	Storage temperature	$T_{stg}$	-40 ~ +100	$^\circ C$
	*2 Soldering temperature	$T_{sol}$	260	$^\circ C$

\*1 Pulse width  $\leq 100\mu s$ , Duty ratio = 0.01

\*2 For 5 seconds

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	$V_F$	$I_F = 20\text{mA}$	—	1.2	1.4	V
	Peak forward voltage	$V_{FM}$	$I_{FM} = 0.5\text{A}$	—	3.0	4.0	V
	Reverse current	$I_R$	$V_R = 3\text{V}$	—	—	10	$\mu\text{A}$
Output	Collector dark current	$I_{CEO}$	$V_{CE} = 20\text{V}$	—	$10^{-9}$	$10^{-7}$	A
Transfer characteristics	Current transfer ratio	GP1S01	$I_F = 20\text{mA}, V_{CE} = 5\text{V}$	10	20	150	%
		GP1S01F		8	20	120	%
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F = 40\text{mA}, I_C = 1\text{mA}$	—	—	0.4	V
	Response time (Rise)	$t_r$	$I_C = 2\text{mA}, V_{CE} = 2\text{V}, R_L = 100\Omega$	—	3	15	$\mu\text{s}$
Response time (Fall)	$t_f$	—		4	20	$\mu\text{s}$	

Fig. 1 Forward Current vs. Ambient Temperature

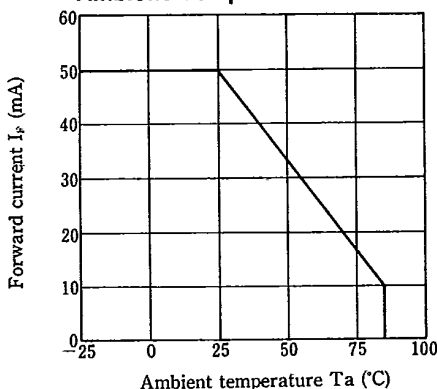


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

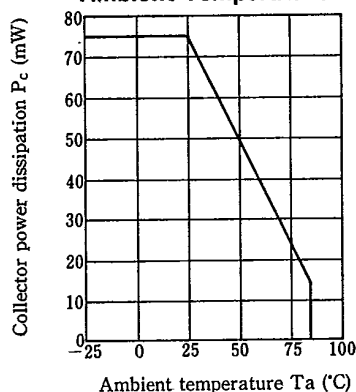


Fig. 3 Peak Forward Current vs. Duty Ratio

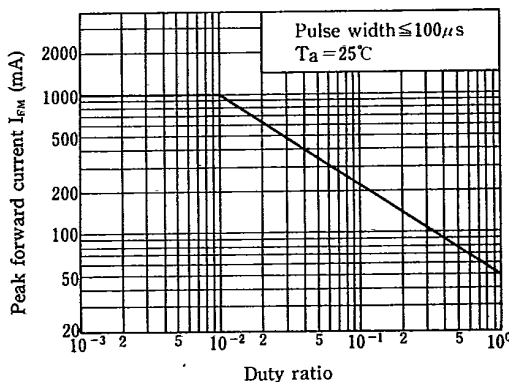
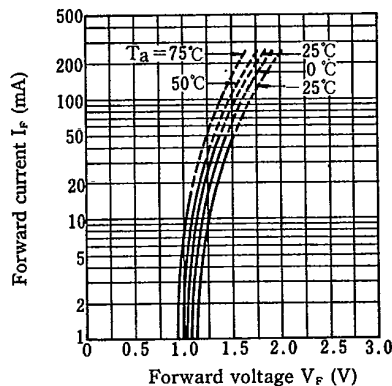
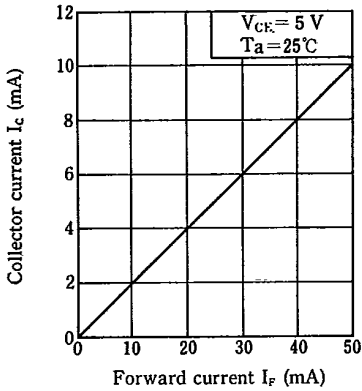


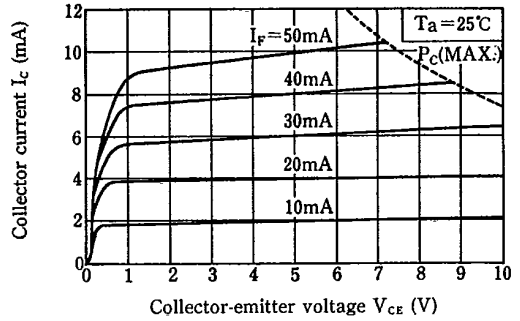
Fig. 4 Forward Current vs. Forward Voltage



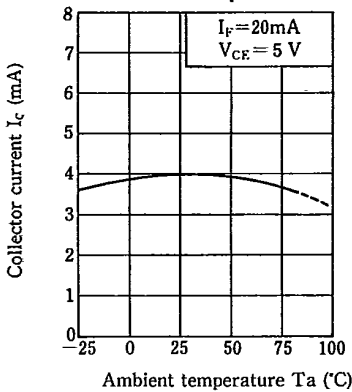
**Fig. 5 Collector Current vs. Forward Current**



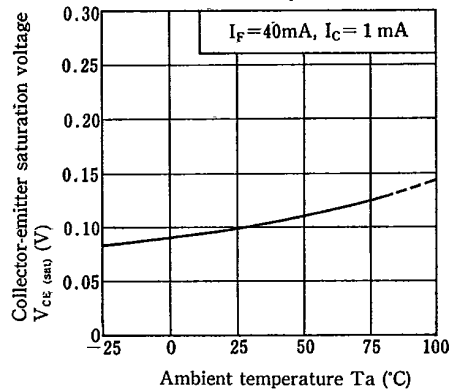
**Fig. 6 Collector Current vs. Collector-emitter Voltage**



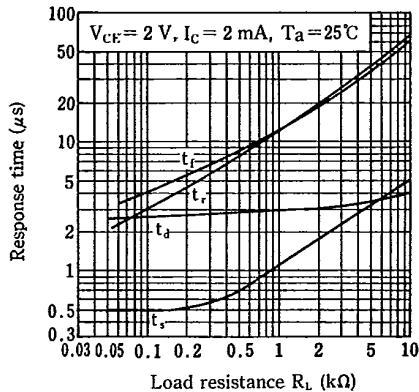
**Fig. 7 Collector Current vs. Ambient Temperature**



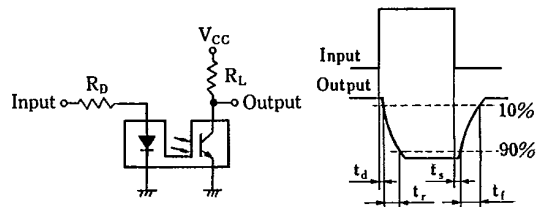
**Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature**



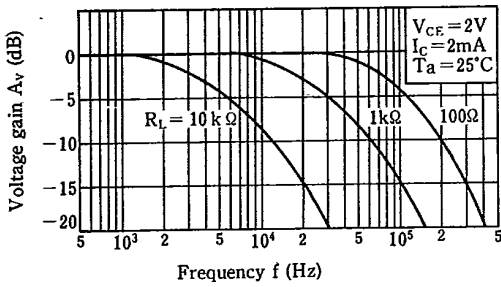
**Fig. 9 Response Time vs. Load Resistance**



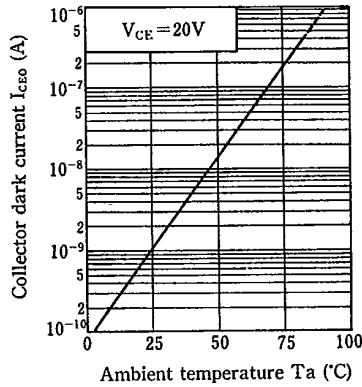
**Test Circuit for Response Time**



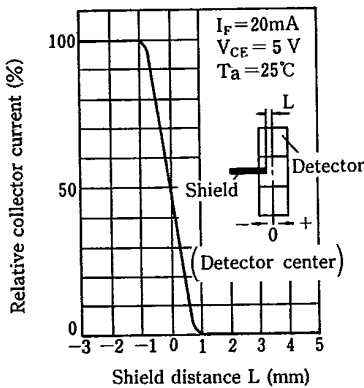
**Fig. 10 Frequency Response**



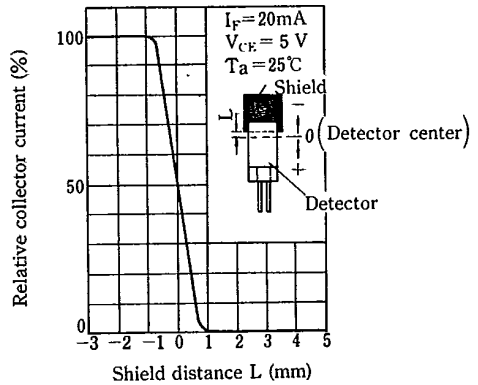
**Fig. 11 Collector Dark Current vs. Ambient Temperature**



**Fig. 12 Relative Collector Current vs. Shield Distance (1)**



**Fig. 13 Relative Collector Current vs. Shield Distance (2)**



**Fig. 14 Collector Current vs. Illuminance (Reference)**

