

GP1S01/GP1S01F High Speed Photointerrupter

■ Features

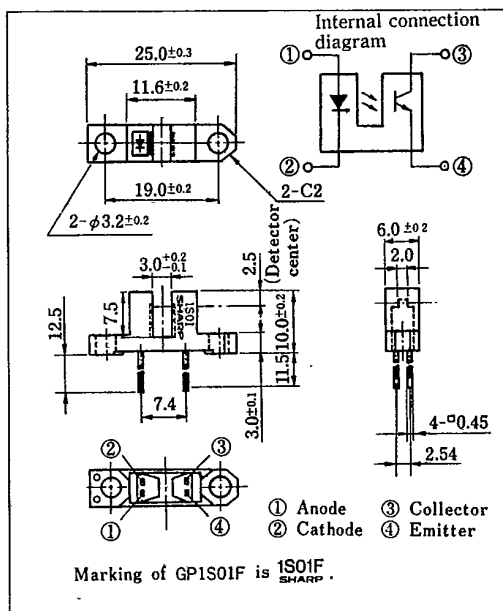
1. High speed response (t_r : TYP. $3\mu s$ at $R_L = 100\Omega$)
2. High current transfer ratio
 $\left. \begin{array}{l} \text{GP1S01 CTR : MIN. 10\%} \\ \text{GP1S01F CTR : MIN. 8\%} \end{array} \right\} \text{ at } I_F = 20\text{mA}$
3. Visible light cut-off type : GP1S01F

■ 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)



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■ Absolute Maximum Ratings

(Ta=25°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	°C
	Storage temperature	T_{stg}	-40 ~ +100	°C
	*2 Soldering temperature	T_{sol}	260	°C

*1 Pulse width ≤ 100μs, Duty ratio = 0.01

*2 For 5 seconds

SHARP

T-41-73

(Ta=25°C)

■ Electro-optical Characteristics

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	μA
Output	Collector dark current		I_{CEO}	$V_{CE}=20\text{V}$	—	10^{-9}	10^{-7}	A
Transfer characteristics	Current transfer ratio	GP1S01	CTR	$I_F=20\text{mA}$, $V_{CE}=5\text{V}$	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	μs
	Response time (Fall)		t_f		—	4	20	μs

Fig. 1 Forward Current vs. Ambient Temperature

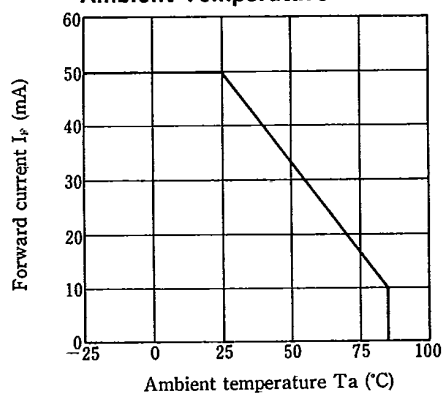


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

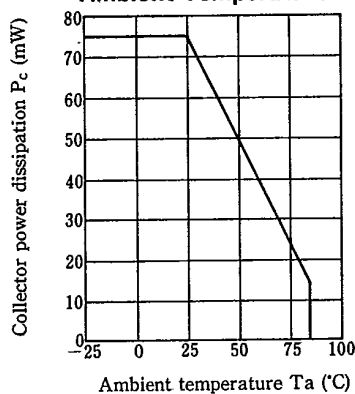


Fig. 3 Peak Forward Current vs. Duty Ratio

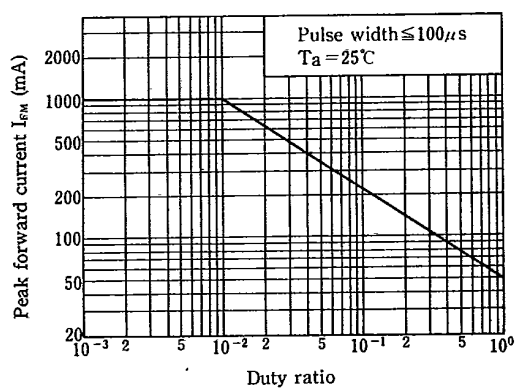
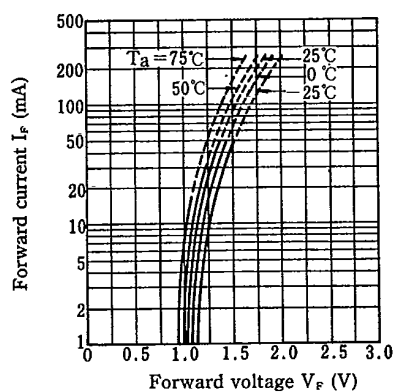


Fig. 4 Forward Current vs. Forward Voltage



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Fig. 5 Collector Current vs. Forward Current

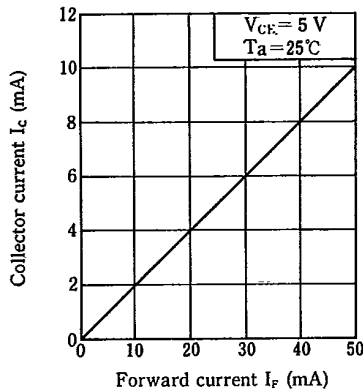


Fig. 6 Collector Current vs. Collector-emitter Voltage

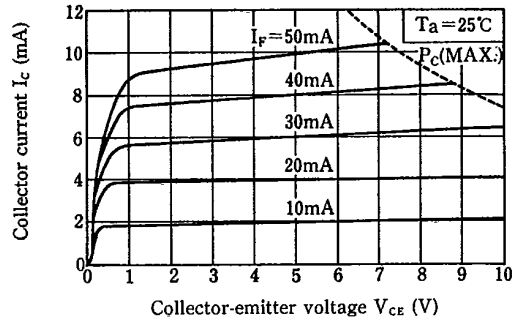


Fig. 7 Collector Current vs. Ambient Temperature

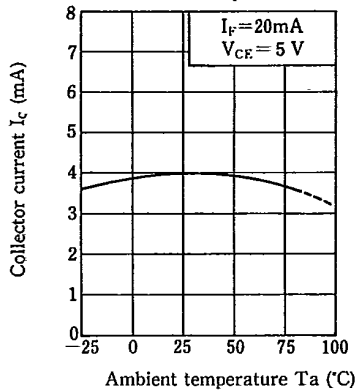
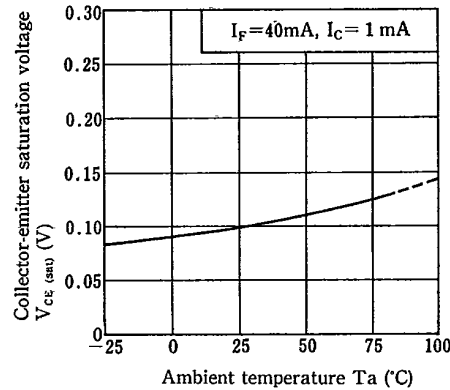
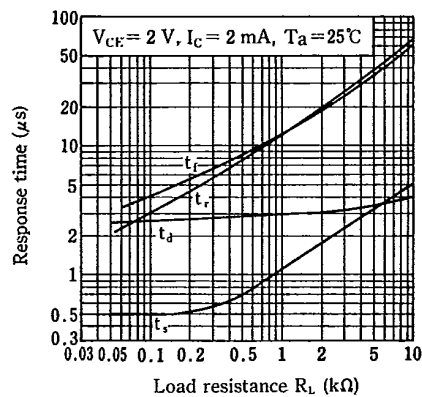


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature



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Fig. 9 Response Time vs. Load Resistance



Test Circuit for Response Time

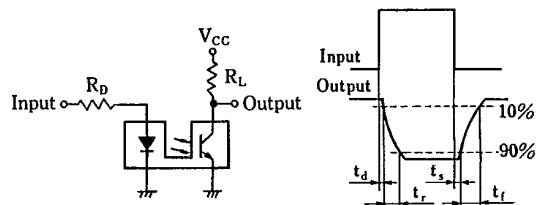


Fig. 10 Frequency Response

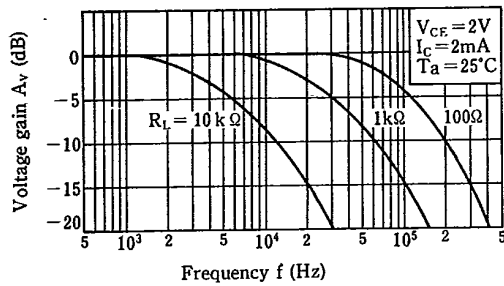


Fig. 11 Collector Dark Current vs. Ambient Temperature

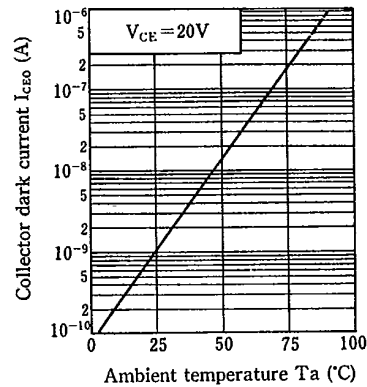


Fig. 12 Relative Collector Current vs. Shield Distance (1)

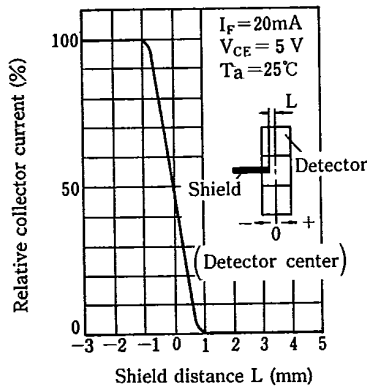


Fig. 13 Relative Collector Current vs. Shield Distance (2)

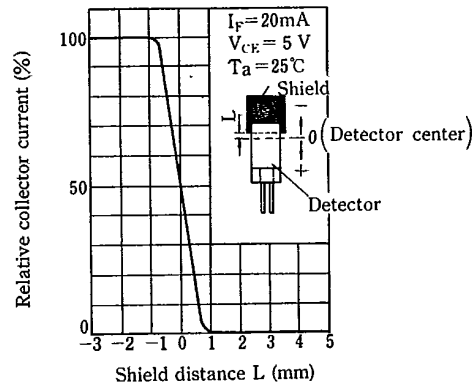


Fig. 14 Collector Current vs. Illuminance (Reference)

