GP1S01/GP1S01F High Speed Photointerrupter

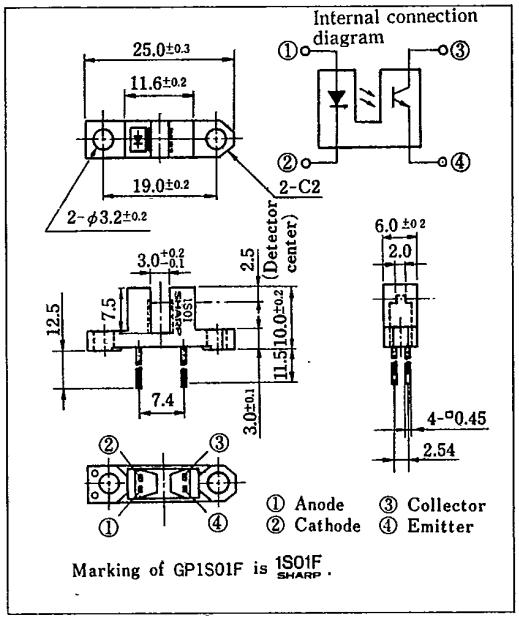
■ Features

1. High speed response (t_r : TYP. 3μs at R_L = 100Ω)
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)



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■ Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1Peak 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
*2Soldering temperature		T_{sol}	260	°C

*1 Pulse width≦100μs, Duty ratio=0.01
*2 For 5 seconds

■ Electro-optical Characteristics

(Ta=25°C)

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

Fig. 1 Forward Current vs. Ambient Temperature

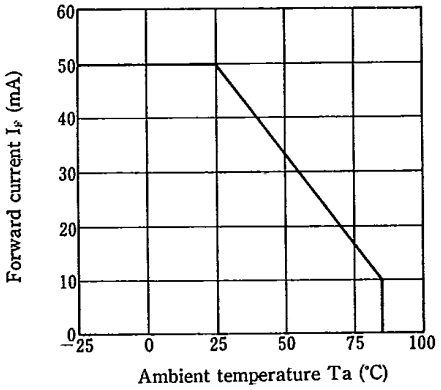


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

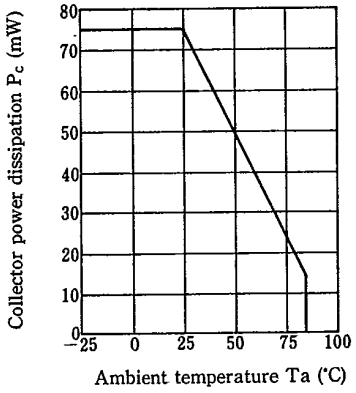


Fig. 3 Peak Forward Current vs. Duty Ratio

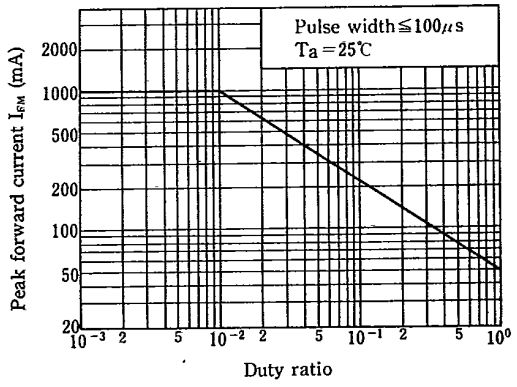


Fig. 4 Forward Current vs. Forward Voltage

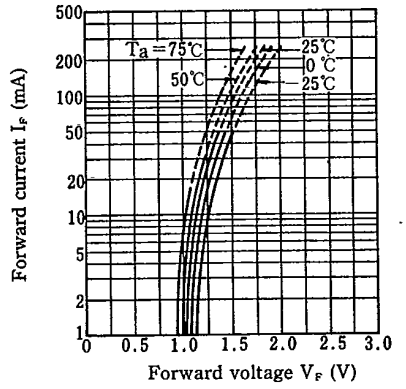


Fig. 5 Collector Current vs. Forward Current

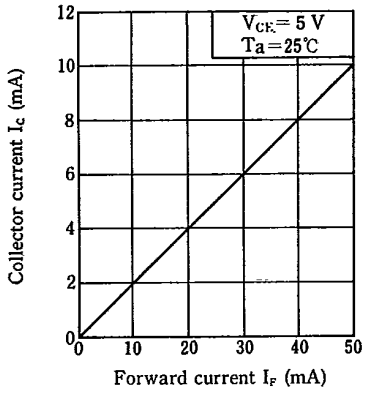


Fig. 6 Collector Current vs. Collector-emitter Voltage

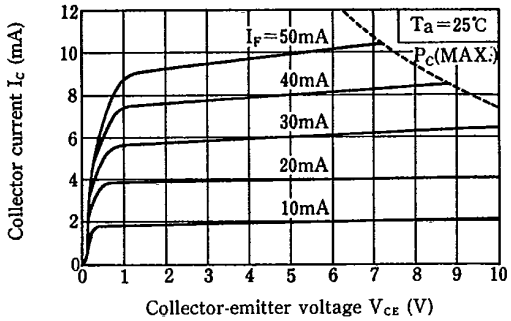


Fig. 7 Collector Current vs. Ambient Temperature

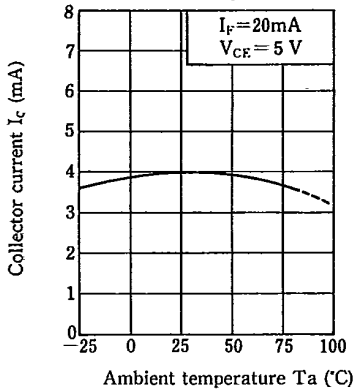


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

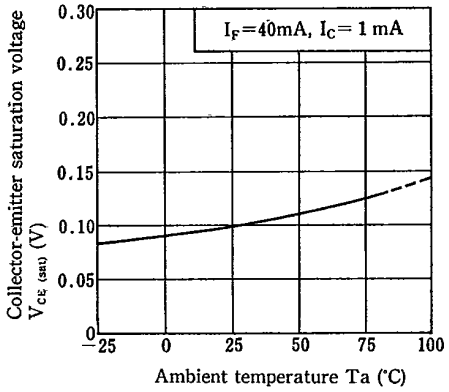
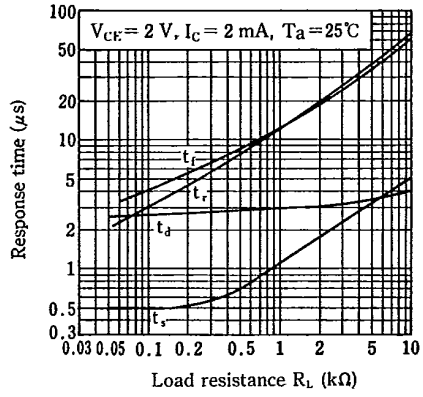


Fig. 9 Response Time vs. Load Resistance



Test Circuit for Response Time

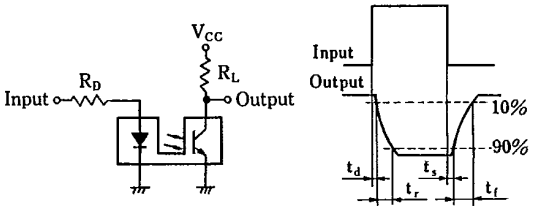


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Fig. 10 Frequency Response

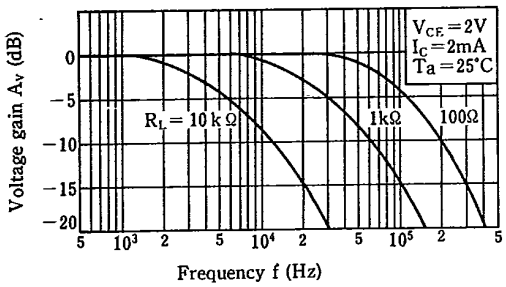


Fig. 11 Collector Dark Current vs. Ambient Temperature

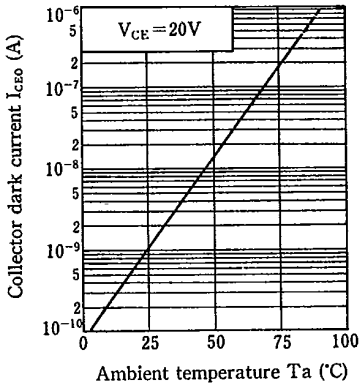


Fig. 12 Relative Collector Current vs. Shield Distance (1)

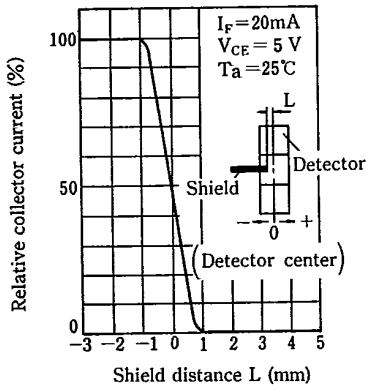


Fig. 13 Relative Collector Current vs. Shield Distance (2)

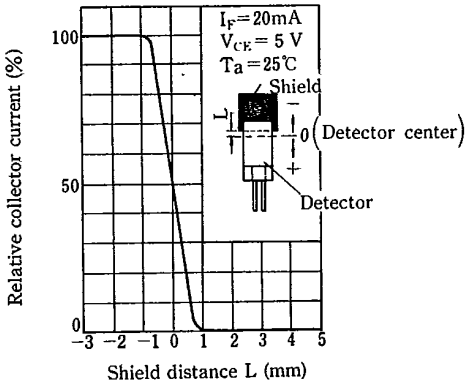
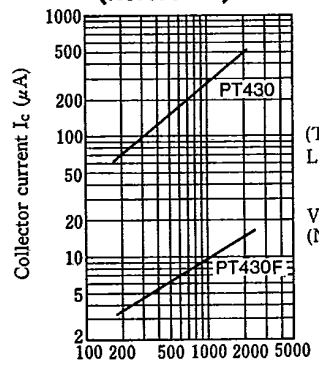


Fig. 14 Collector Current vs. Illuminance (Reference)



(Test Condition)
Light source :
White fluorescent lamp
Sharp FLR-40SW/M
V_{CE}=2V, Ta=25°C
(Note) Comparison between outputs of transparent resin molded type phototransistor (PT430) and visible light cut-off resin molded type (PT430F)