GP1S11 Linear Output Type Photointerrupter

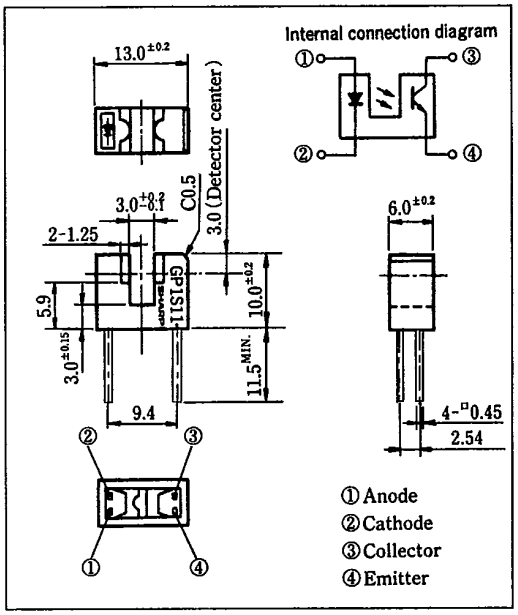
■ Features

1. Long linear detection distance
2. High speed response (t_r: TYP. 3μs at R_L= 100Ω)
3. PWB direct mounting type package

■ Applications

1. Record players

■ Outline Dimensions (Unit : mm)



■ 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	4	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	CTR	I_F=20mA, V_{CE}=5V	11.5	—	100	%
	Collector-emitter saturation voltage	$V_{CE(sat)}$	I_F=40mA, I_C=0.5mA	—	—	0.4	V
	Response time (Rise)	t_r	V_{CE}=2V, I_C=2mA,	—	3	15	μs
	Response time (Fall)	t_f	R_L=100Ω	—	4	20	μs
	*3Linear distance		I_F=20mA, V_{CE}=5V	1.26	—	1.95	mm

*3 moving distance during collector current (I_C) changes 90% to 10% of the initial value.

(Note)
The housing is made of resin that cuts off visible light and transmits infrared light. Take into due consideration the effects that external disturbing lights might have on these characteristics when mounting as the output current will increase resulting in liner characteristics errors if a light containing long wavelength ingredient (such as sunlight or tungsten lamp light) enters as an external disturbing light.

Fig. 1 Forward Current vs. Ambient Temperature

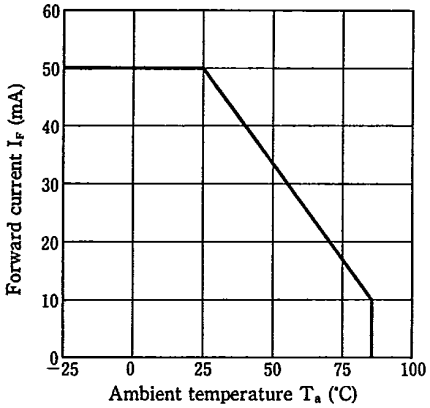


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

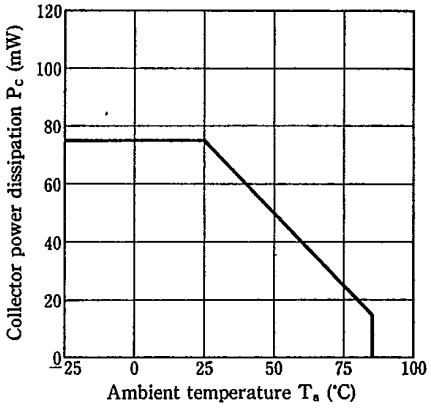


Fig. 3 Peak Forward Current vs. Duty Ratio

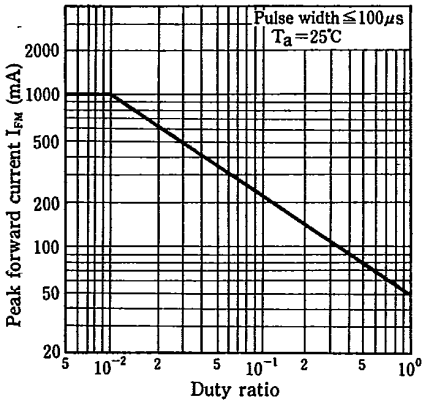


Fig. 4 Forward Current vs. Forward Voltage

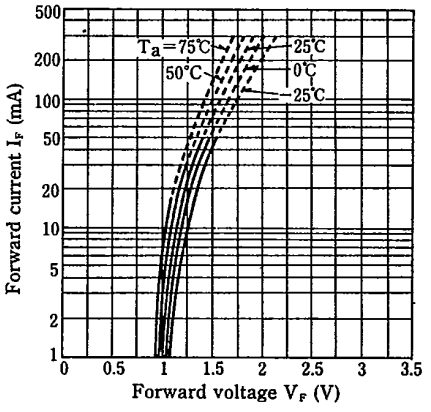


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Fig. 5 Collector Current vs. Forward Current

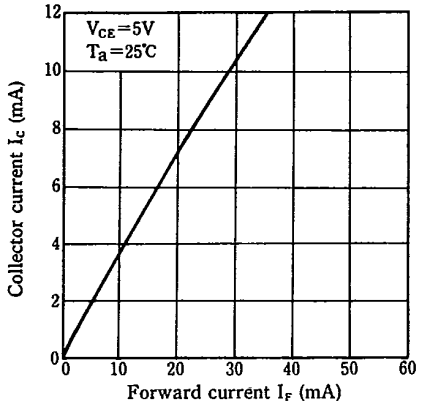


Fig. 6 Collector Current vs. Collector-emitter Voltage

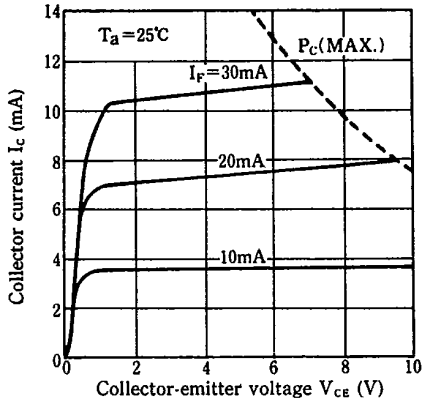


Fig. 7 Collector Current vs. Ambient Temperature

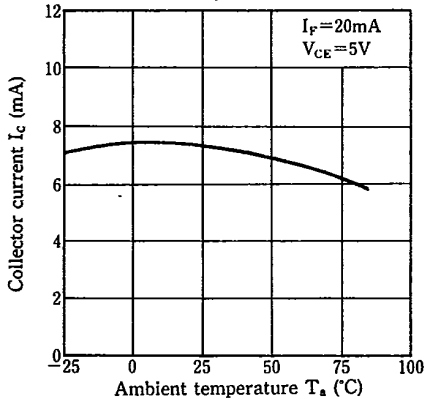


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

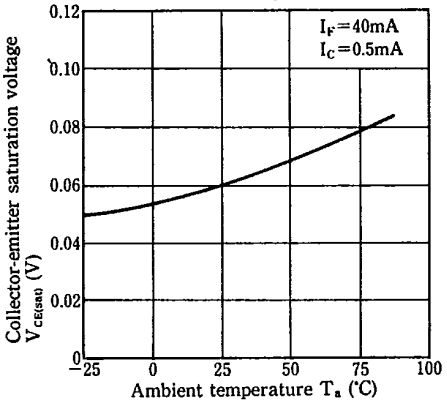
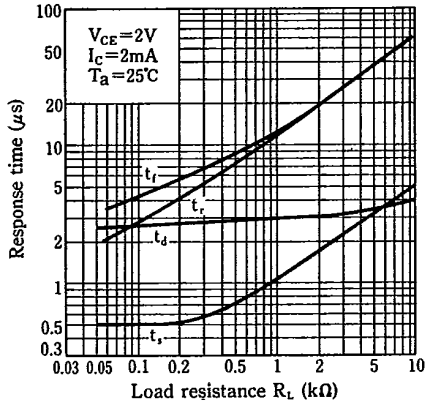


Fig. 9 Response Time vs. Load Resistance



Test Circuit for Response Time

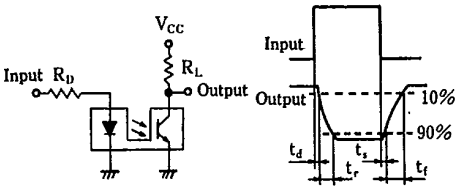


Fig. 10 Frequency Response

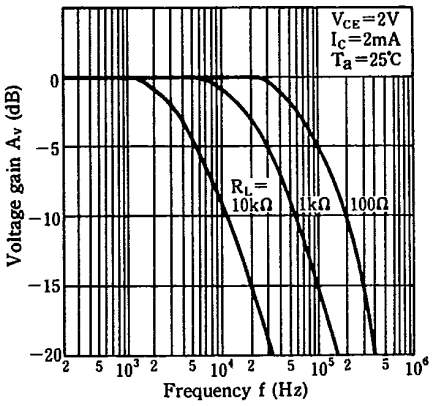


Fig. 11 Collector Dark Current vs. Ambient Temperature

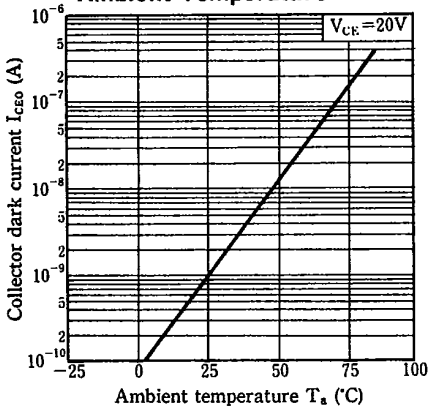


Fig. 12 Relative Collector Current vs. Shield Distance (1)

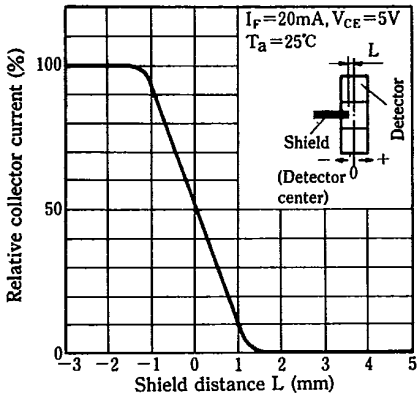
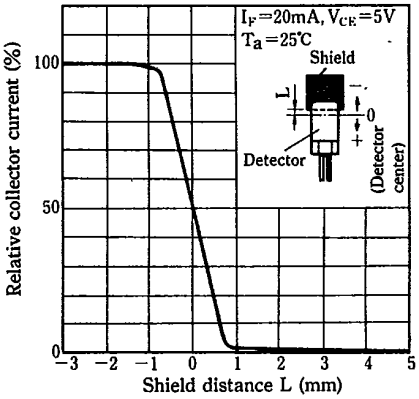


Fig. 13 Relative Collector Current vs. Shield Distance (2)



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