

# GP1SQ50/GP1SQ51V High Reliability GP1SQ52/GP1SQ53 Photointerrupter

## ■ Features

### 1. High reliability

Temperature cycling test : 80% or more of lower specification limit after 100 cycling

Conditions :

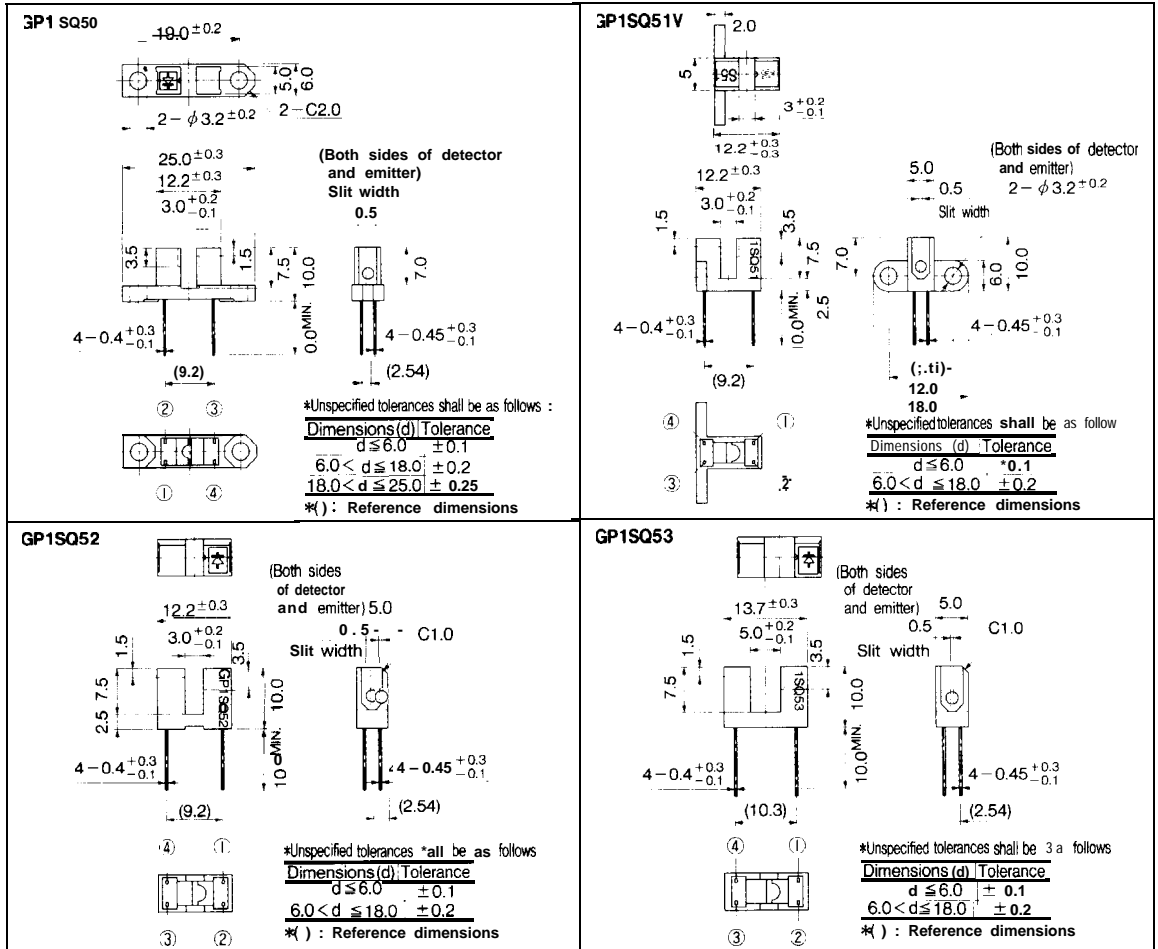
- 40°C (30 minutes) to + 25°C (5 minutes)
- to 100°C (30 minutes) to + 25°C (5 minutes)

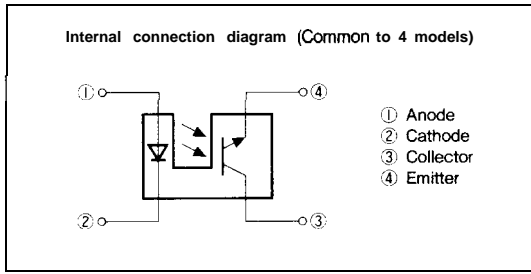
- 2. Both-sides mounting type **GP1SQ50** (Gap: 3mm, slit width: 0.5mm)
- One-side mounting type **GP1SQ51V** (Gap: 3mm, slit width: 0.5mm)
- PWB direct mounting type **GP1SQ52** (Gap: 3mm, slit width: 0.5mm)
- GP1SQ53** (Gap: 5mm, slit width: 0.5mm)

- 1. Oil fan heaters
- 2. Automatic vending machines

## ■ Outline Dimensions

(Unit : mm)





**Absolute Maximum Ratings** (Ta = 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	5(l)	mA
	*1 Peak forward current	$I_{FM}$	1	A
	Reverse voltage	$V_R$	6	v
power divination		$P$	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 power temperature		$T_{opr}$	-30 to +85	°C
Storage temperature		$T_{stg}$	-40 to +100	°C
**2 Soldering temperature		$T_{sol}$	260	°C

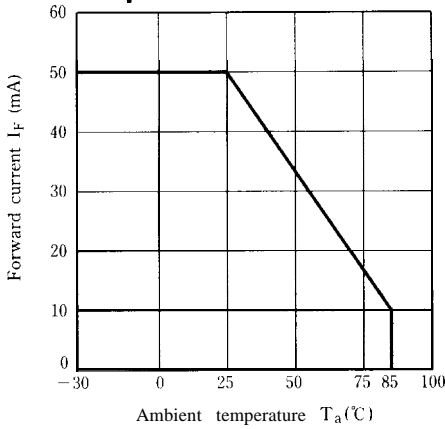
\*1 Pulse width  $\leq 100 \mu s$ , Duty ratio = 0.01  
\*2 For 5 seconds

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

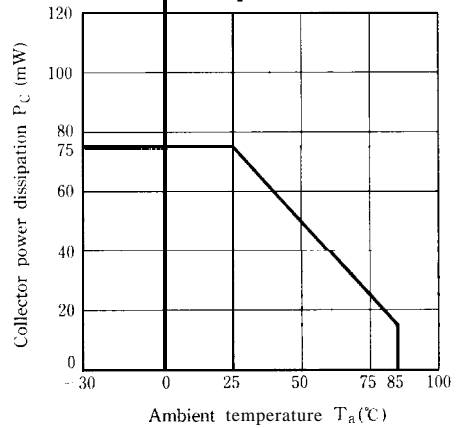
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit			
Input	Forward voltage	$V_F$	$I_F = 20mA$	-	1.25	1.4	v			
	Peak forward voltage	$V_{FM}$	$I_{FM} = 0.5A$	-	3	4	v			
	Reverse current	$I_R$	$V_R = 3V$	-	-	10	$\mu A$			
output	Collector dark current	$I_{CEO}$	$V_{CE} = 20V$	-	1	100	nA			
Transfer charac teristics	Current transfer ratio	CTR	$V_{CE} = 5V, I_F = 20mA$	2.5	-	50	%			
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F = 40mA, *3 I_C = 0.5mA$	-	-	0.4	v			
			Response time	Rise time	$t_r$	$V_{CE} = 2V, I_C = 2mA$	-	3	15	$\mu s$
				Fall time	$t_f$	$R_L = 100 \Omega$	-	4	20	$\mu s$

\*3  $I_C = 0.2mA$  (GP1SQ53)

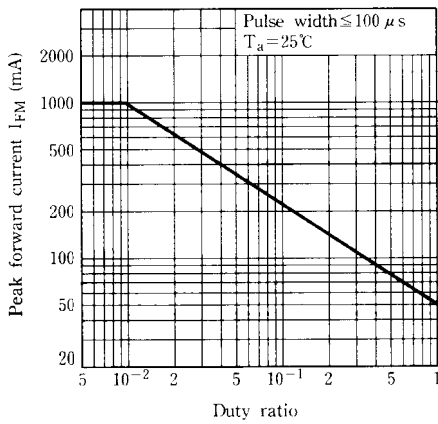
**Fig. 1 Forward Current vs. Ambient Temperature**



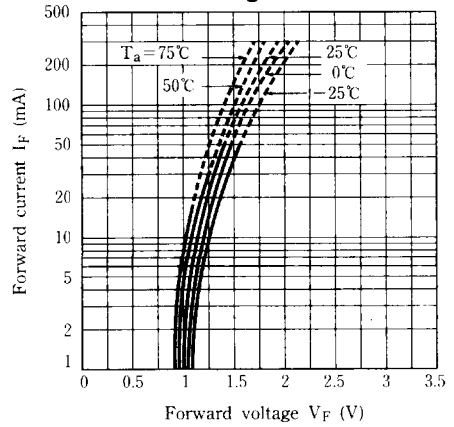
**Fig. 2 Collector Power Dissipation vs. Ambient Temperature**



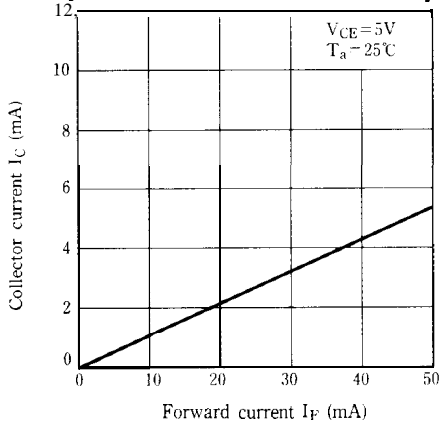
**Fig. 3 Peak Forward Current vs. Duty Ratio**



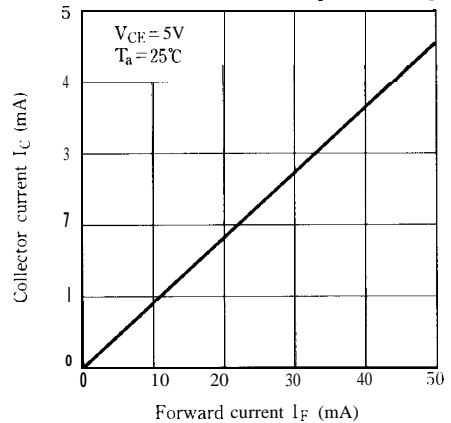
**Fig. 4 Forward Current vs. Forward Voltage**



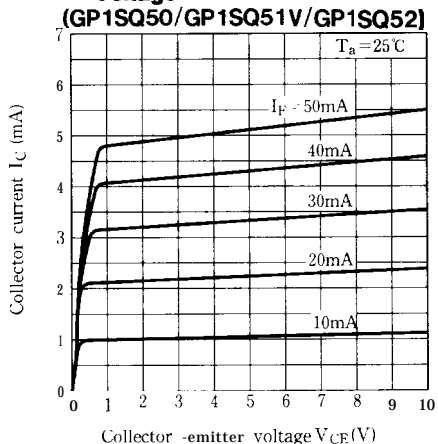
**Fig. 5-a Collector Current vs. Forward Current (GP1SQ50/GP1SQ51V/GP1SQ52)**



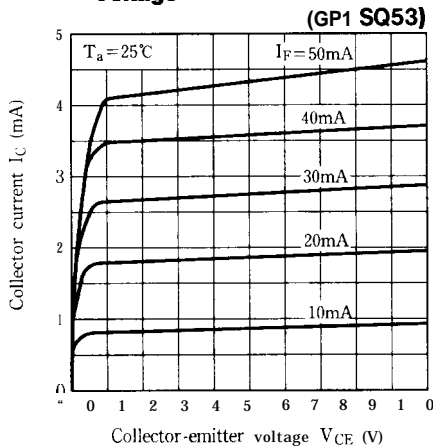
**Fig. 5-b Collector Current vs. Forward Current (GP1SQ53)**



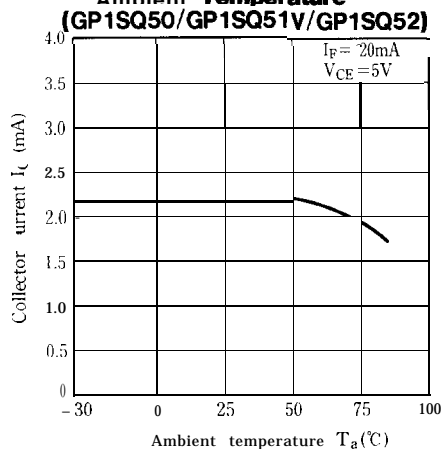
**Fig. 6-a Collector Current vs. Collector-emitter Voltage**



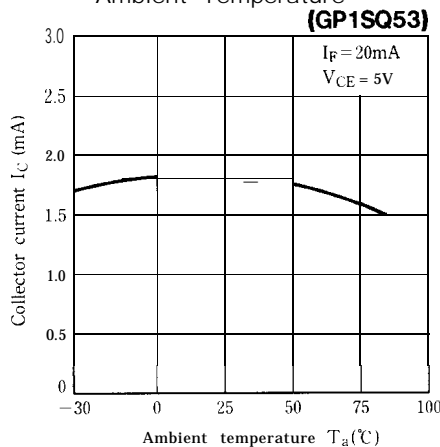
**Fig. 6-b Collector Current vs. Collector-emitter Voltage**



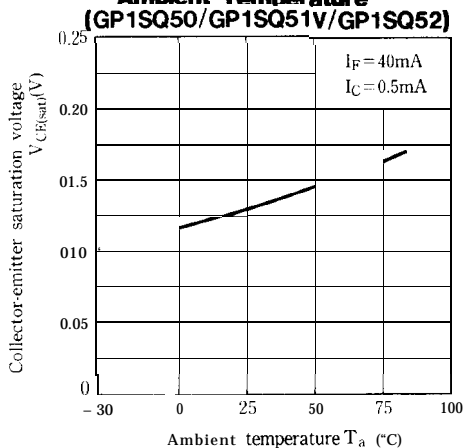
**Fig. 7-a Collector Current vs. Ambient Temperature**



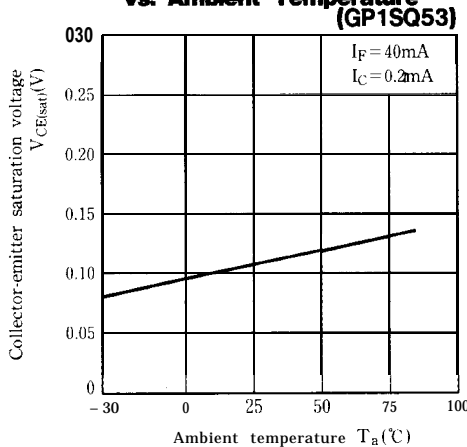
**Fig. 7-b Collector Current vs. Ambient Temperature**



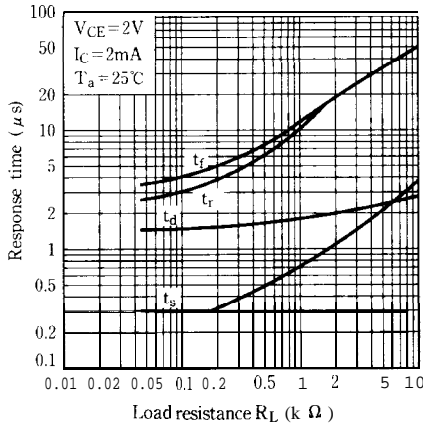
**Fig. 8-a Collector-emitter Saturation Voltage vs. Ambient Temperature**



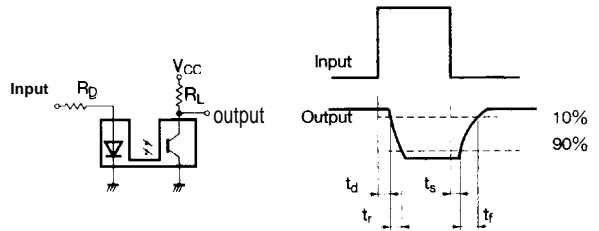
**Fig. 8-b Collector-emitter Saturation Voltage vs. Ambient Temperature**



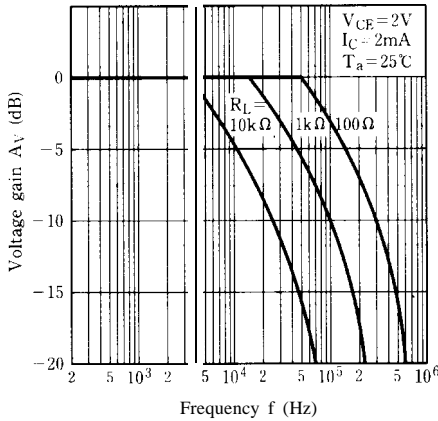
**Fig. 9 Response Time vs. Load Resistance**



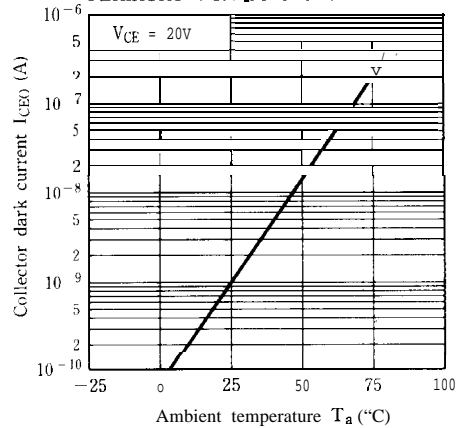
**Test Circuit for Response Time**



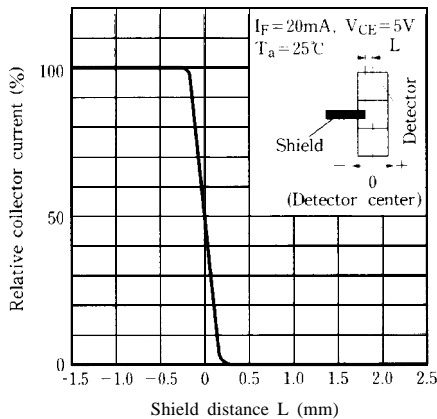
**Fig.10 Frequency Response**



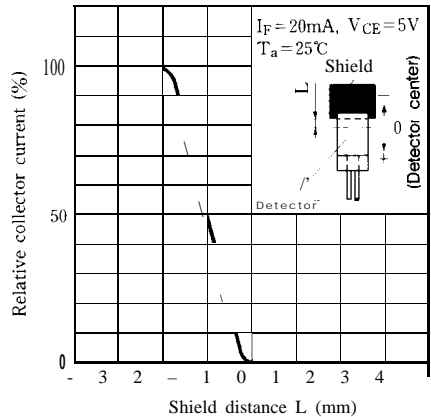
**Fig.11 Collector Dark Current vs. Ambient Temperature**



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



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



● Please refer to the chapter "Precautions for Use." (Page 78 to 93)