

Features

- Non-contact switching.
- For direct PC board or dual-in-line socket mounting.
- Fast switching speed.

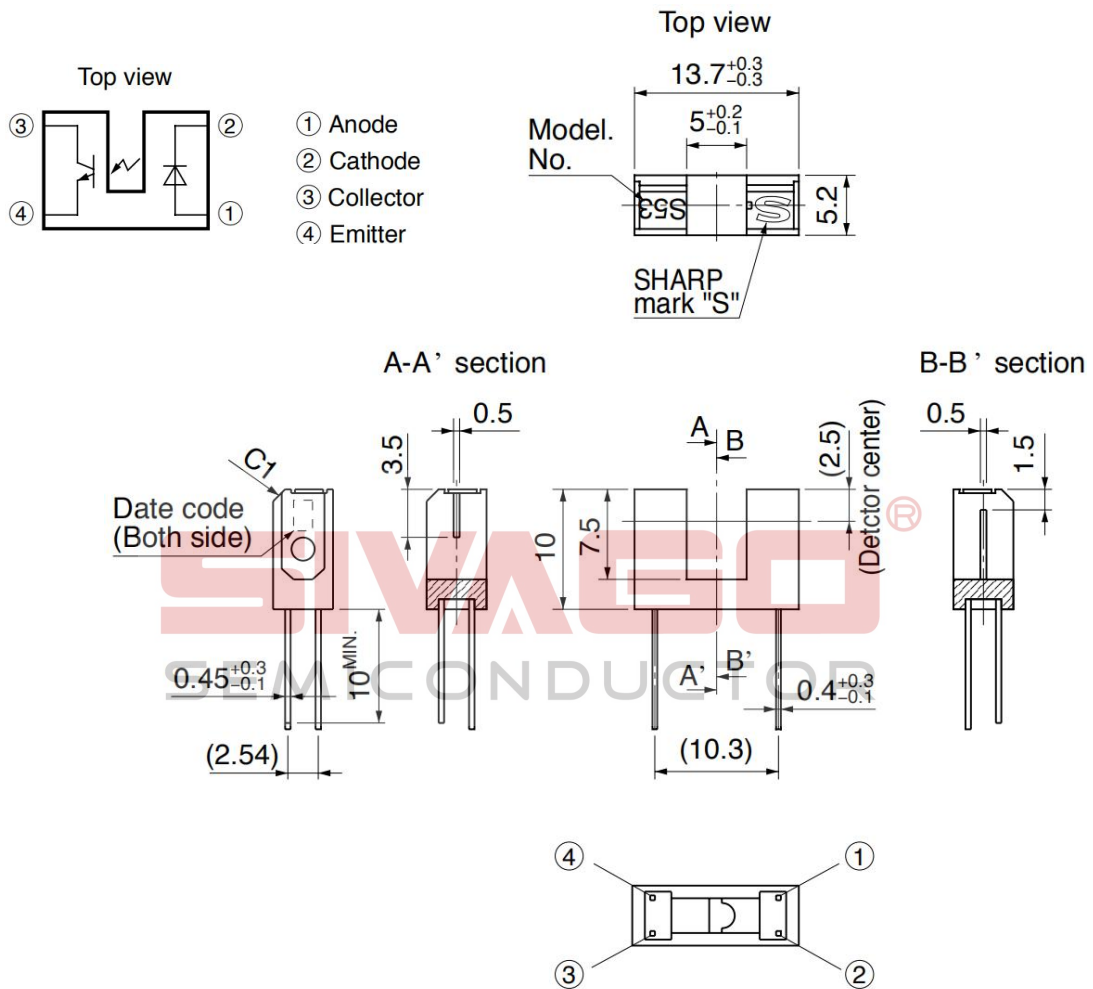
Application

- Scanner
- Edge,Position Detections
- FAX machine
- Counter

Description

The GP1S53 series consist of Gallium Arsenide infrared emitting diode and a NPN silicon phototransistor mounted in a black plastic housing. Phototransistor switching takes place whenever an opaque object passes through the slot. These series are designed for direct soldering into PC board or mounting in standard dual-in-line socket.

PACKAGE DIMENSIONS



NOTES:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm} (.010\text{'})$ unless otherwise noted.
3. Lead spacing is measured where the leads emerge from the package.

ABSOLUTE MAXIMUM RATINGS AT TA =25°C

Parameter		Symbol	Rating	Unit
Input	*1 Forward current	I_F	50	mA
	*1, 2 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
	*1 Collector power dissipation	P_C	75	mW
Operating temperature		T_{opr}	-25 to +85	°C
Storage temperature		T_{stg}	-40 to +100	°C
*3 Soldering temperature		T_{sol}	260	°C

ELECTRICAL OPTICAL CHARACTERISTICS AT TA=25°C

Parameter		Symbol	Condition	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	μA
Output	Collector dark current	I_{CEO}	$V_{CE}=20V$	-	1	100	nA
Transfer characteristics	Collector current	I_C	$V_{CE}=5V, I_F=20mA$	0.5	-	15	mA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F=40mA, I_C=0.2mA$	-	-	0.4	V
	Response time	Rise time	t_r	$V_{CE}=2V, I_C=2mA, R_L=100\Omega$	-	3	15
Fall time		t_f	-		4	20	

Fig.1 Forward Current vs. Ambient Temperature

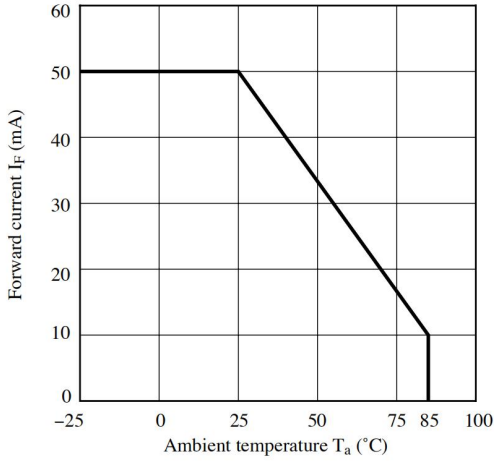


Fig.2 Collector Power Dissipation vs. Ambient Temperature

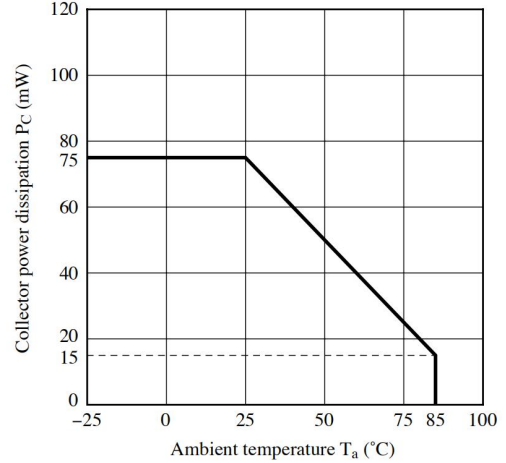


Fig.3 Peak Forward Current vs. Duty Ratio

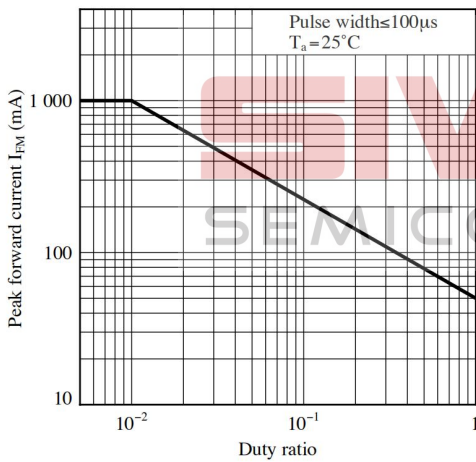


Fig.4 Forward Current vs. Forward Voltage

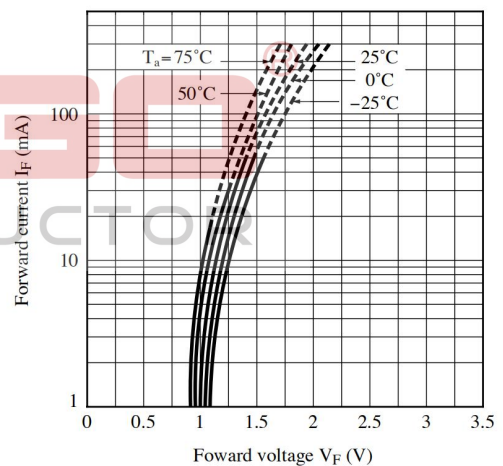


Fig.5 Collector Current vs. Forward Current

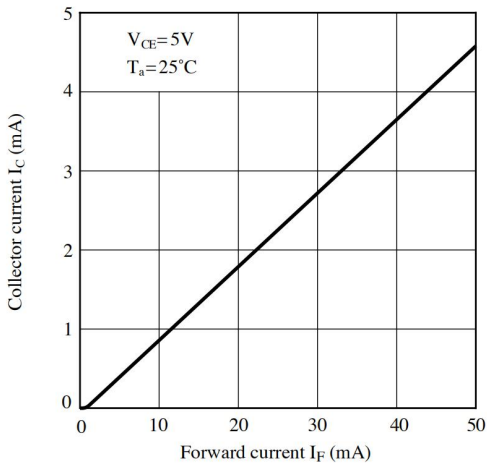


Fig.6 Collector Current vs. Collector-emitter Voltage

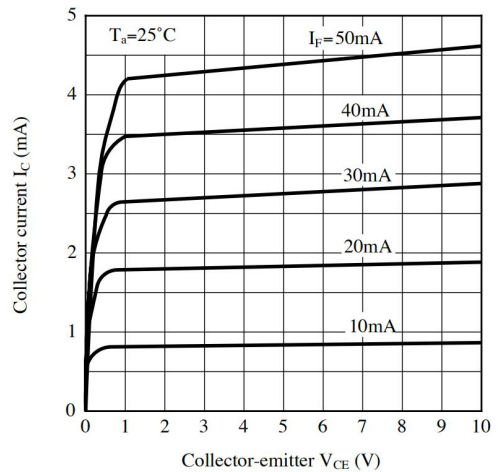


Fig.7 Collector Current vs. Ambient Temperature

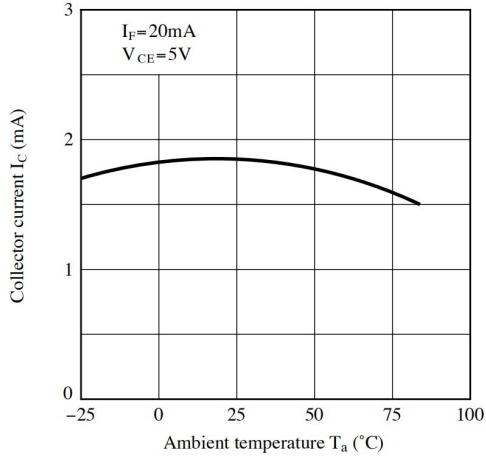


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

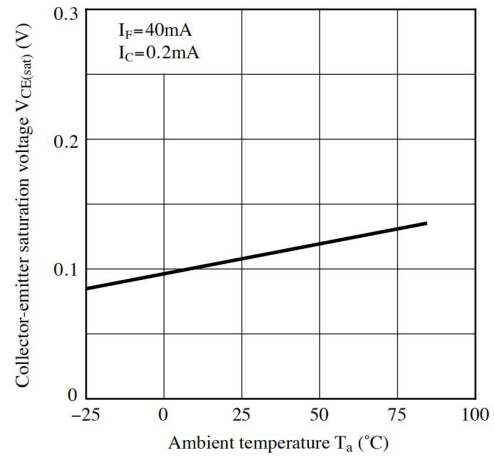


Fig.9 Response Time vs. Load Resistance

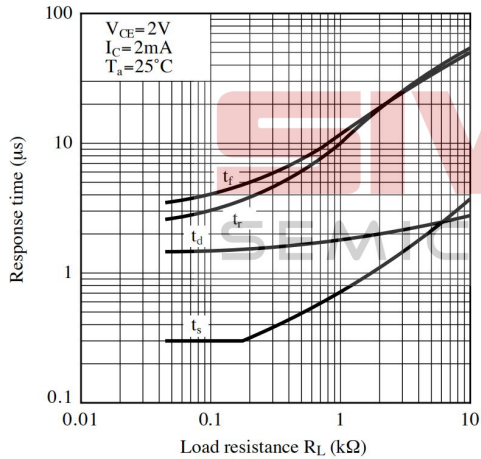


Fig.10 Test Circuit for Response Time

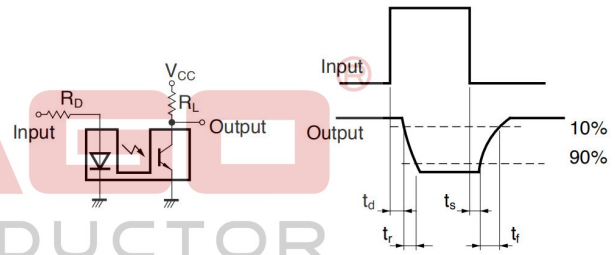


Fig.11 Frequency Response

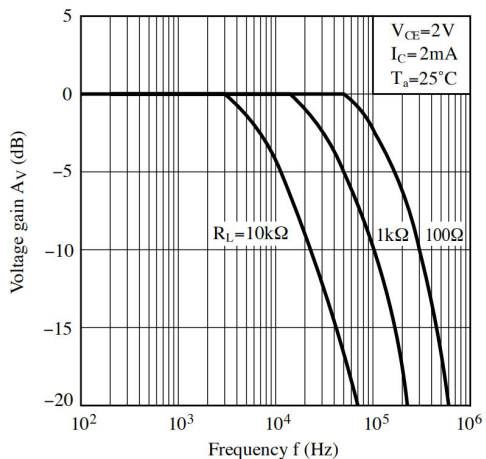


Fig.12 Collector Dark Current vs. Ambient Temperature

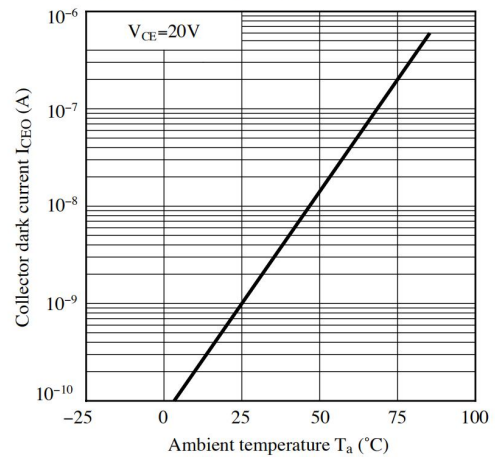
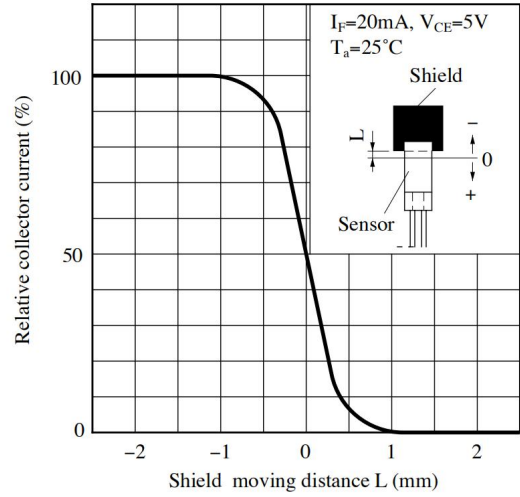
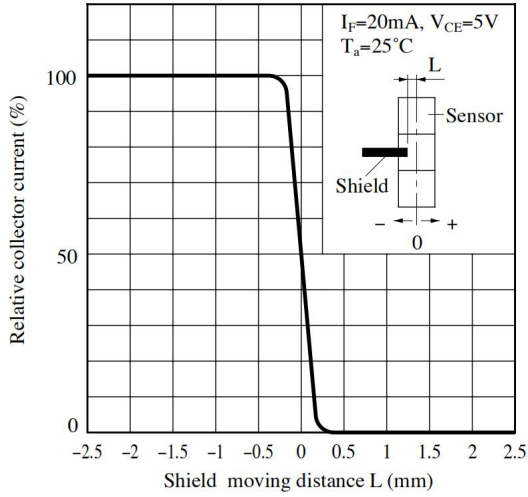


Fig.13 Detecting Position Characteristics (1)

Fig.14 Detecting Position Characteristics (2)



Remarks : Please be aware that all data in the graph are just for reference and not for guarantee.



Packing Quantity Specification

1. 200Pcs/1Bag,10 Bag/1Box
2. 4Boxes/1Carton

Label Form Specification

製品名 PRODUCT	
コードNo. CODE No.	
数量 Q'TY	
ロットNo. LOT No.	
備考 REMARKS	
	

- PRODUCT: Part Number
- CODE NO.: Product Serial Number
- QTY: Packing Quantity
- LOT No: Lot Number
- REMARKS:Remarks

Notes

Lead Forming

1. During lead frame bending, the lead frame should be bent at a distance more than 3mm from bottom of the epoxy.

Note: Must fix lead frame and do not touch epoxy before bending to avoid Photo Interrupter broken.

2. Lead forming should be done before soldering.

3. Avoid stressing the Photo Interrupter package during leads forming. The stress to the base may damage the characteristics of Photo Interrupter, or it may break the Photo Interrupter.

4. Cut the Photo Interrupter lead frame at room temperature. Cutting the lead frame at high temperatures may cause failure of the Photo Interrupter.

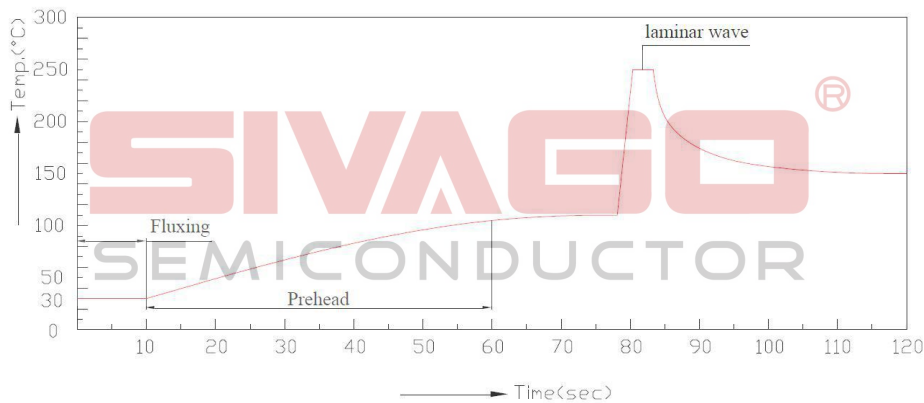
5. When mounting the Photo Interrupter onto a PCB, the PCB holes must be aligned exactly with the lead position of the Photo Interrupter. If the Photo Interrupter are mounted with stress at The leads, it causes deterioration of the epoxy resin and this will degrade the Photo Interrupter.

Soldering

- Careful attention should be paid during soldering. When soldering, leave more than 3mm from solder joint to epoxy bulb, and soldering beyond the base of the tie bar is recommended.
- Recommended soldering conditions:

Hand Soldering		DIP Soldering	
Temp. at tip of iron	300°C Max. (30W Max.)	Preheat temp.	100°C Max. (60 sec Max.)
Soldering time	3 sec Max.	Bath temp. & time	260 Max., 5 sec Max
Distance	3mm Min.(From solder joint to epoxy bulb)	Distance	3mm Min. (From solder joint to epoxy bulb)

3. Recommended soldering profile



- Avoiding applying any stress to the lead frame while the Photo Interrupter are at high temperature particularly when soldering.
- Dip and hand soldering should not be done more than one time
- After soldering the Photo Interrupter, the epoxy bulb should be protected from mechanical shock or vibration until the Photo Interrupter return to room temperature.
- A rapid-rate process is not recommended for cooling the Photo Interrupter down from the peak temperature.
- Although the recommended soldering conditions are specified in the above table, dip or hand soldering at the lowest possible temperature is desirable for the Photo Interrupter.
- Wave soldering parameter must be set and maintain according to recommended temperature and dwell time in the solder wave.

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