

# GP1L53V Datasheet

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|                              |   |
|------------------------------|---|
| DiGi Electronics Part Number | GP1L53V-DG  |
| Manufacturer                 | <a href="#">Sharp Microelectronics</a>                              |
| Manufacturer Product Number  | GP1L53V   |
| Description                  | SENSOR OPT SLOT DARL PCB MOUNT                                      |
| Detailed Description         | Optical Sensor Through-Beam 0.197" (5mm) Photo darlington PCB Mount |

This model GP1L53V is available at DiGi Electronics.

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## Purchase and inquiry

Manufacturer Product Number:

GP1L53V

Series:

-

Sensing Distance:

0.197" (5mm)

Output Configuration:

Photodarlington

Current - Collector (Ic) (Max):

40 mA

Response Time:

80µs, 70µs

Mounting Type:

Through Hole

Type:

Unamplified

Manufacturer:

Sharp Microelectronics

Product Status:

Obsolete

Sensing Method:

Through-Beam

Current - DC Forward (If) (Max):

50 mA

Voltage - Collector Emitter Breakdown (Max):

35 V

Operating Temperature:

-25°C ~ 85°C

Package / Case:

PCB Mount

## Environmental & Export classification

RoHS Status:

RoHS non-compliant

ECCN:

EAR99

Moisture Sensitivity Level (MSL):

3 (168 Hours)

HTSUS:

8541.49.8000

# GP1L53V

## Compact, High Sensing Accuracy Type Photointerrupter

### ■ Features

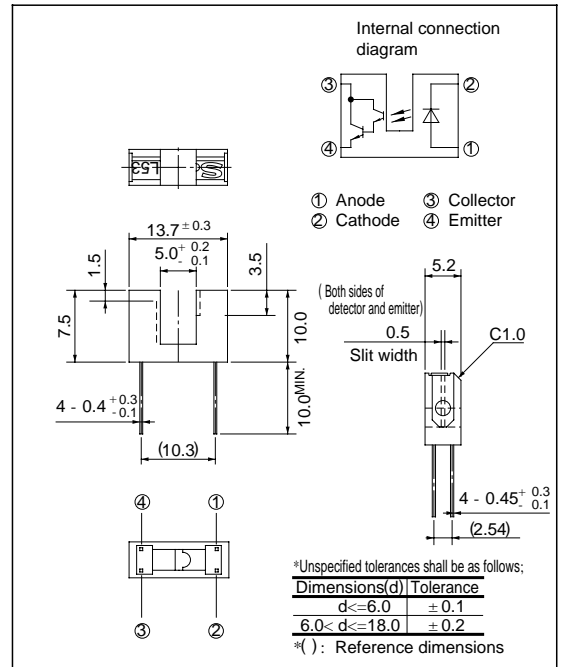
1. Compact type
2. High sensing accuracy (Slit width: 0.5mm)
3. High current transfer ratio  
(CTR: MIN. 30% at  $I_F = 1\text{mA}$ )
4. PWB direct mounting type

### ■ Applications

1. OA equipment such as FDDs, printers, facsimiles, etc.
2. VCRs
3. Optoelectronic switches

### ■ Outline Dimensions

( Unit : mm )



### ■ Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

| 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           | $I_C$     | 40            | mA               |
|                          | Collector power dissipation | $P_C$     | 75            | mW               |
| Operating temperature    |                             | $T_{opr}$ | - 25 to + 85  | $^\circ\text{C}$ |
| Storage temperature      |                             | $T_{stg}$ | - 40 to + 100 | $^\circ\text{C}$ |
| *2 Soldering temperature |                             | $T_{sol}$ | 260           | $^\circ\text{C}$ |

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

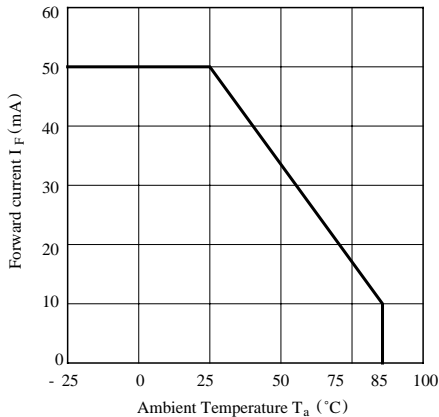
\*2 For 5 seconds

**■ Electro-optical Characteristics**

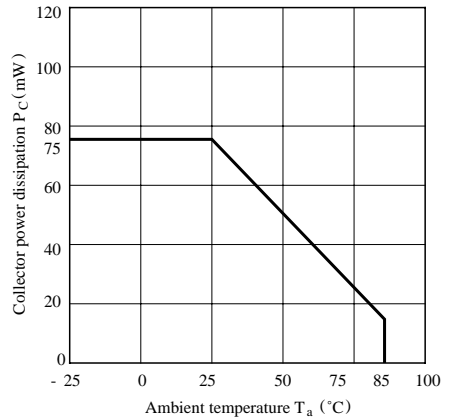
( $T_a = 25^\circ\text{C}$ )

| Parameter                |                                      | Symbol        | Conditions                             | MIN.                                   | TYP. | MAX.      | Unit          |               |
|--------------------------|--------------------------------------|---------------|--|--|------|-----------|---------------|---------------|
| Input                    | Forward voltage                      | $V_F$         | $I_F = 20\text{mA}$                    | -                                      | 1.25 | 1.4       | V             |               |
|                          | Peak forward voltage                 | $V_{FM}$      | $I_{FM} = 0.5\text{A}$                 | -                                      | 3    | 4         | V             |               |
|                          | Reverse current                      | $I_R$         | $V_R = 3\text{V}$                      | -                                      | -    | 10        | $\mu\text{A}$ |               |
| Output                   | Collector dark current               | $I_{CEO}$     | $V_{CE} = 10\text{V}$                  | -                                      | -    | $10^{-6}$ | A             |               |
| Transfer characteristics | Collector Current                    | $I_C$         | $I_F = 1\text{mA}, V_{CE} = 2\text{V}$ | 0.3                                    | -    | 20        | mA            |               |
|                          | Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_F = 2\text{mA}, I_C = 0.3\text{mA}$ | -                                      | -    | 1.0       | V             |               |
|                          | Response time                        | Rise time     | $t_r$                                  | $V_{CE} = 2\text{V}, I_C = 2\text{mA}$ | -    | 80        | 400           | $\mu\text{s}$ |
|                          |                                      | Fall time     | $t_f$                                  | $R_L = 100\Omega$                      | -    | 70        | 350           | $\mu\text{s}$ |

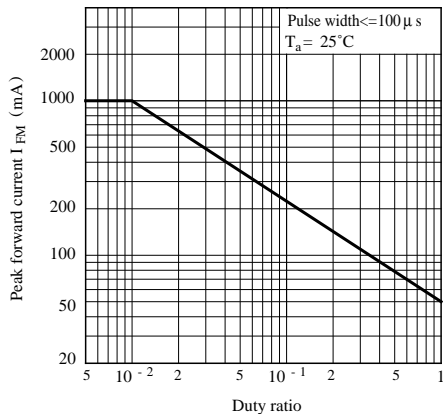
**Fig. 1 Forward Current vs. Ambient Temperature**



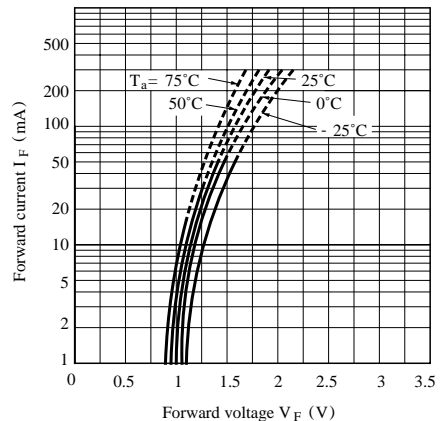
**Fig. 2 Collector Power Dissipation vs. Ambient Temperature**



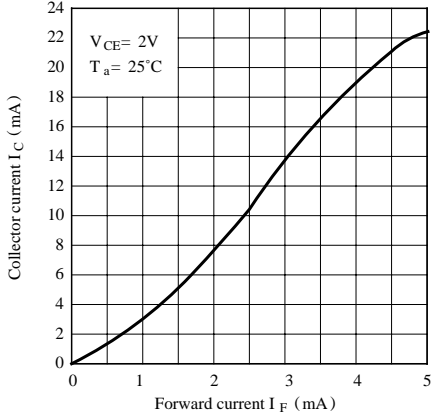
**Fig. 3 Peak Forward Current vs. Duty Ratio**



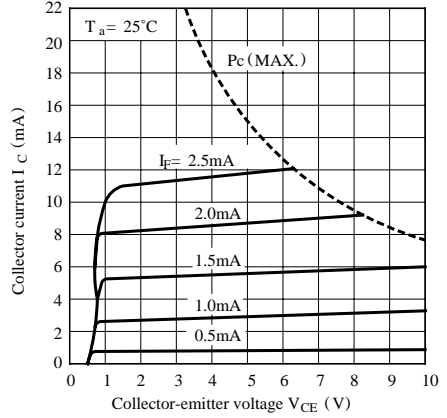
**Fig. 4 Forward Current vs. Forward Voltage**



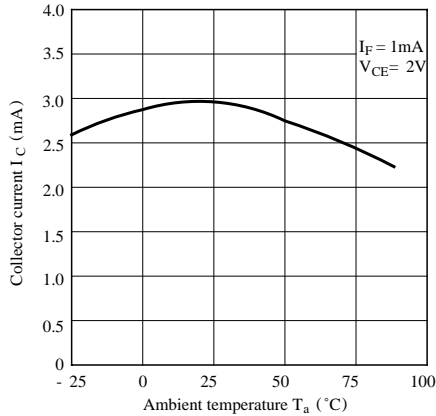
**Fig. 5 Collector Current vs. Forward Current**



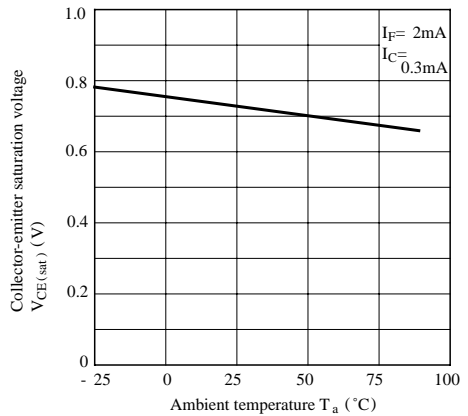
**Fig. 6 Collector Current vs. Collector-emitter Voltage**



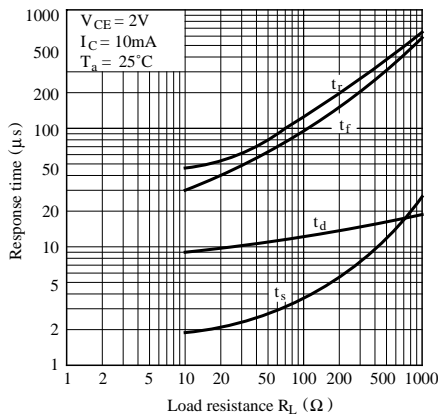
**Fig. 7 Collector Current vs. Ambient Temperature**



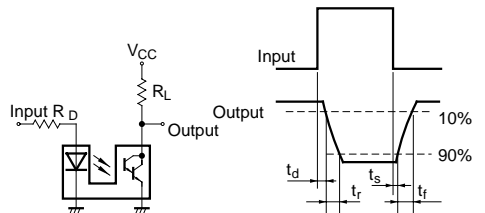
**Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature**



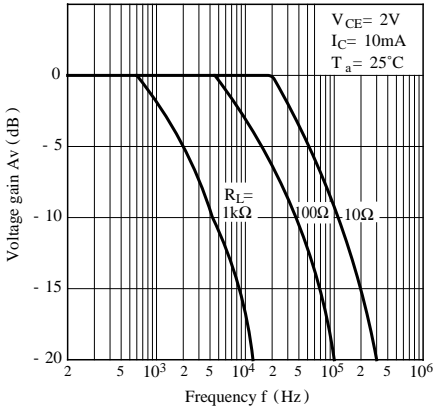
**Fig. 9 Response Time vs. Load Resistance**



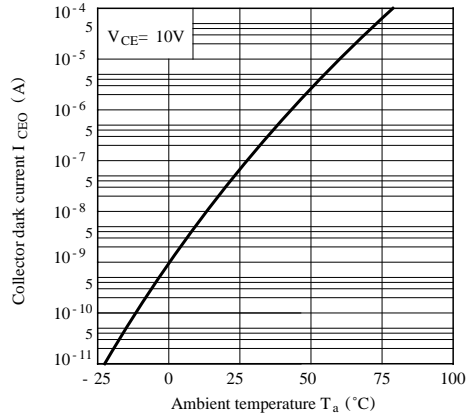
**Test Circuit for Response Time**



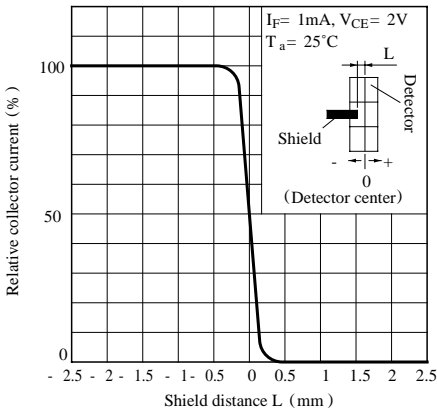
**Fig.10 Frequency Response**



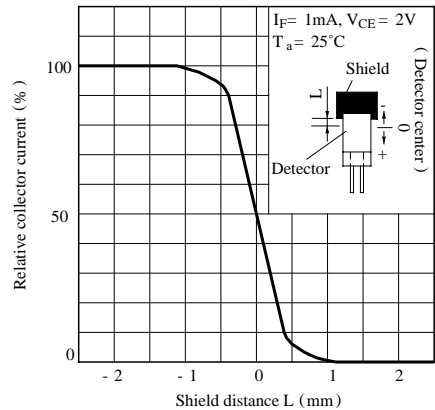
**Fig.11 Collector Dark Current vs. Ambient Temperature**



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



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



**■ Precautions for Use**

- (1) In case of cleaning, use only the following type of cleaning solvent.  
Ethyl alcohol, Methyl alcohol, Isopropyl alcohol
- (2) As for other general cautions, refer to the chapter“Precautions for Use”.

