

GP2L01/GP2L01F

High Sensitivity, Long Focal Distance Type Photointerrupter

■ Features

1. Long focal distance
2. High current transfer ratio

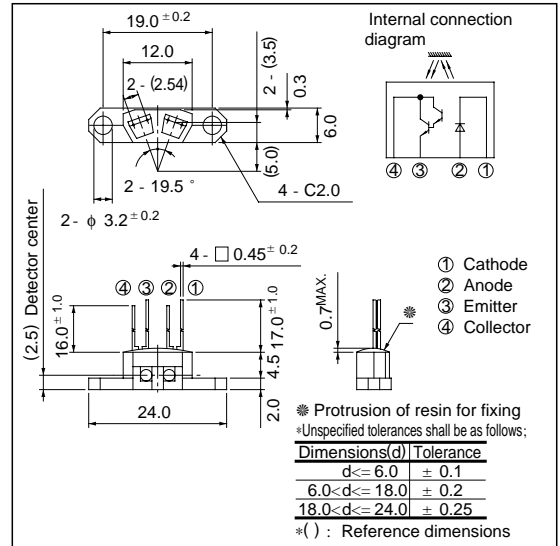
| | | |
|------------------------------|---|------------------------|
| GP2L01 CTR: MIN. 30% | } | at $I_F = 10\text{mA}$ |
| GP2L01F CTR: MIN. 25% | | |
2. Visible light cut-off type: **GP2L01F**

■ Applications

1. Copiers, printers
2. Automatic vending machines, ticket vending machines
3. Optoelectronic switches, optoelectronic counters

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(Ta = 25°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 | °C |
| Storage temperature | | T_{stg} | - 40 to + 100 | °C |
| *2 Soldering temperature | | T_{sol} | 260 | °C |

*1 Pulse width $\leq 100 \mu\text{s}$, Duty ratio = 0.01

*2 For 3 seconds

■ Electro-optical Characteristics

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

| Parameter | | Symbol | Conditions | MIN. | TYP. | MAX. | Unit | |
|--------------------------|------------------------|----------------|---|--|------|-----------|---------------|---------------|
| Input | Forward voltage | V_F | $I_F = 20\text{mA}$ | - | 1.2 | 1.4 | V | |
| | Peak forward voltage | V_{FM} | $I_{FM} = 0.5\text{A}$ | - | 3.0 | 4.0 | V | |
| | Reverse current | I_R | $V_R = 3\text{V}$ | - | - | 10 | μA | |
| Output | Collector dark current | I_{CEO} | $V_{CE} = 10\text{V}$ | - | - | 10^{-6} | A | |
| Transfer characteristics | *3 Collector Current | GP2L01 | $I_F = 10\text{mA}, V_{CE} = 2\text{V}$ | 3 | - | - | mA | |
| | | GP2L01F | | 2.5 | - | 25 | mA | |
| | Response time | Rise time | t_r | $I_C = 10\text{mA}, V_{CE} = 2\text{V}, R_L = 100\Omega$ $d = 5\text{mm}$ | - | 80 | 400 | μs |
| | | Fall time | t_f | | - | 70 | 350 | μs |
| | *4 Leak current | | I_{LEAK} | $I_F = 10\text{mA}, V_{CE} = 2\text{V}$ | - | - | 100 | μA |

*3 Test method : A reflective object shall be an OMS test card (white) specified by Sharp, and be 5.0mm away from the sensor.

*4 Without reflective object

Fig. 1 Forward Current vs. Ambient Temperature

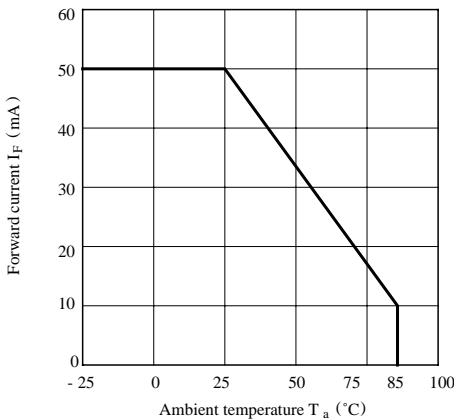


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

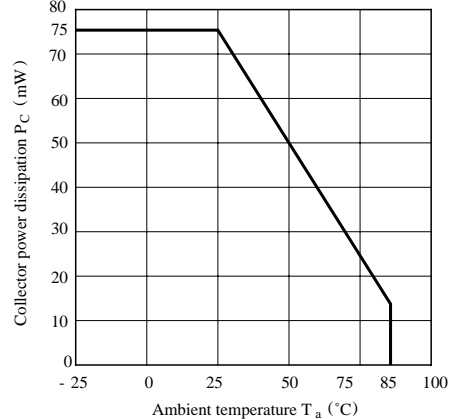


Fig. 3 Peak Forward Current vs. Duty Ratio

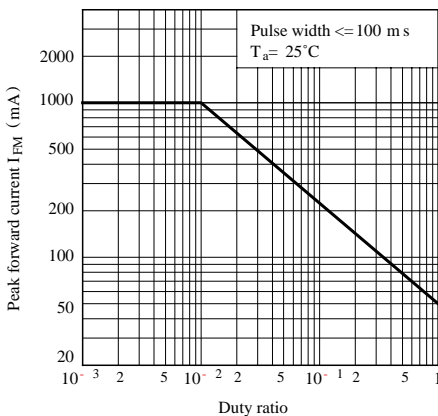


Fig. 4 Forward Current vs. Forward Voltage

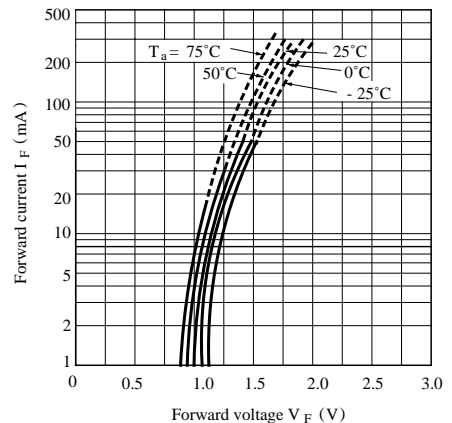


Fig. 5 Collector Current vs. Forward Current

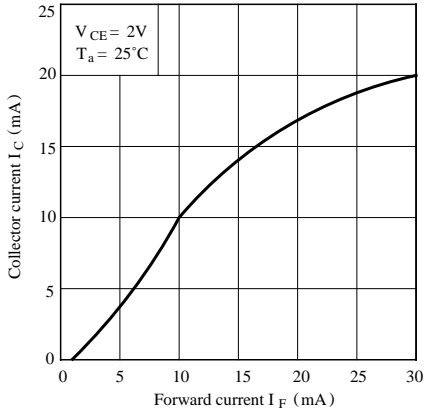


Fig. 6 Collector Current vs. Collector-emitter Voltage

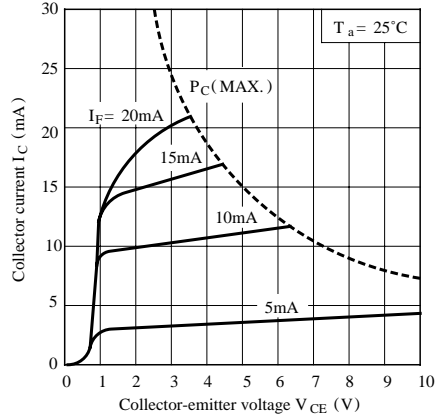


Fig. 7 Relative Collector Current vs. Ambient Temperature

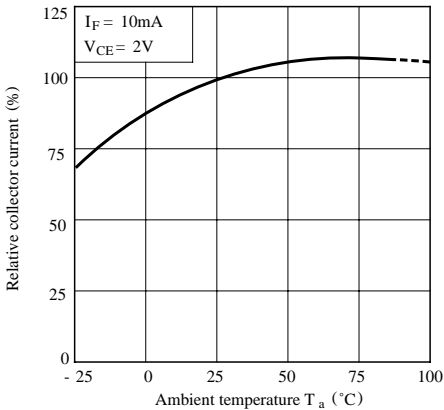


Fig. 8 Collector Dark Current vs. Ambient Temperature

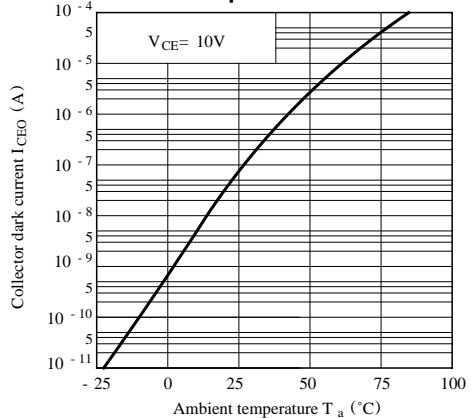
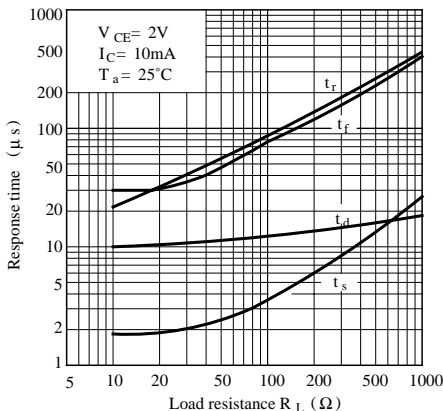


Fig. 9 Response Time vs. Load Resistance



Test Circuit for Response Time

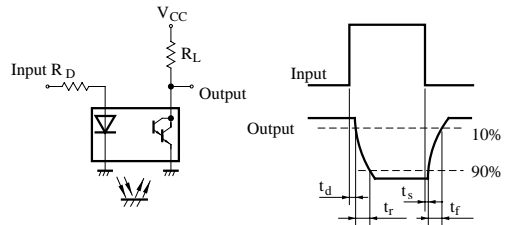


Fig.10 Frequency Response

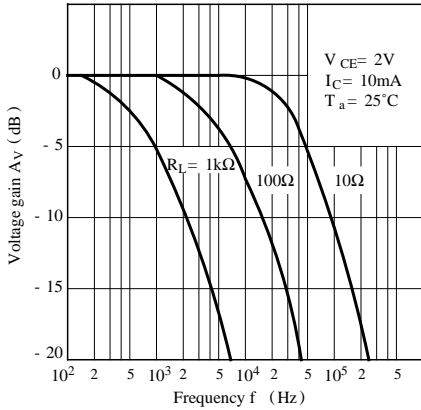


Fig.11 Relative Collector Current vs. Distance between GP2L01 (F) and Test Card

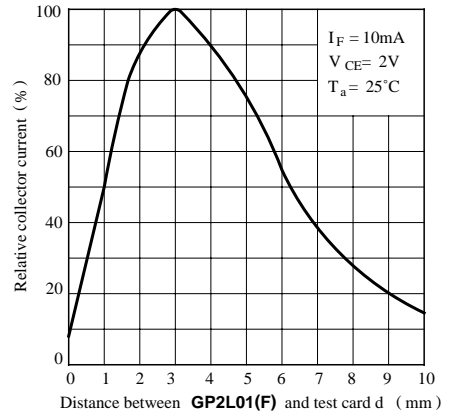
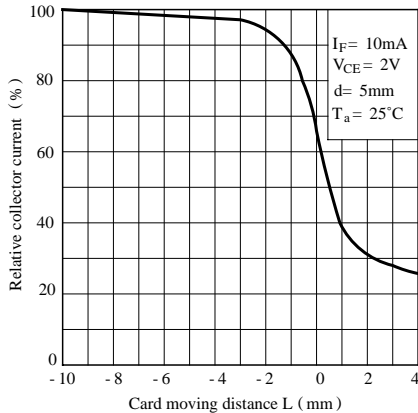


Fig.12 Relative Collector Current vs. Card Moving Distance



Distance Characteristic Test Conditions

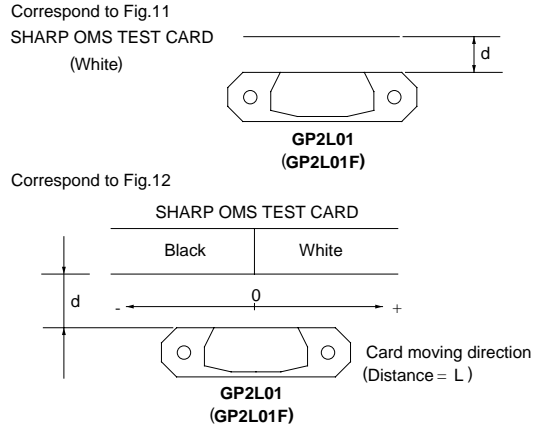
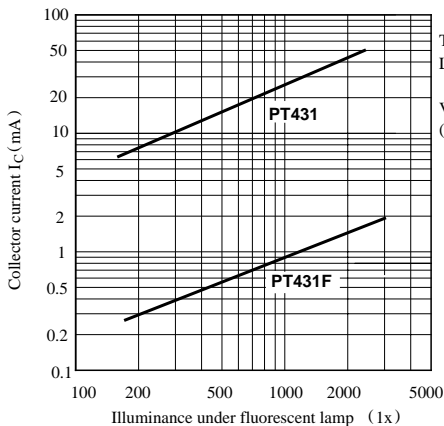


Fig.13 Collector Current vs. Illuminance (Reference)



Test condition
 Light source: White fluorescent lamp
 Sharp FLR-40SW/M
 $V_{CE} = 2V, T_a = 25^\circ C$
 (Note) Comparison between outputs of transparent resin molded type photo-transistor (PT431) and visible light cut-off type (PT431F)

- Please refer to the chapter “Precautions for Use”.



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