# GP1L01/GP1L01F

## High Sensitivity Type Photointerrupter

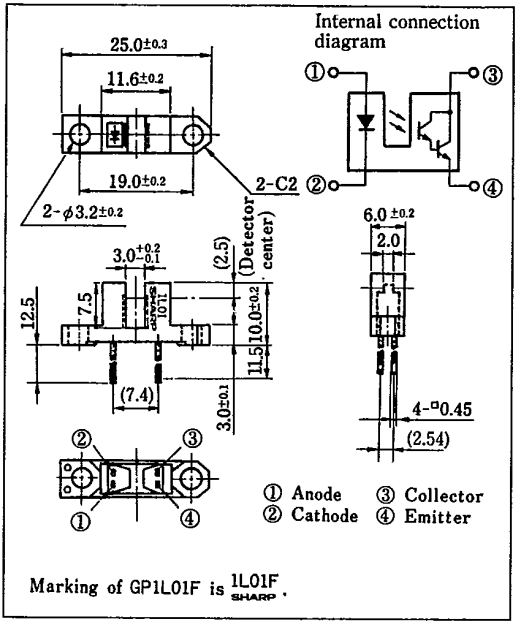
### ■ Features

1. High current transfer ratio
   GP1L01 CTR: MIN. 300%
   GP1L01F CTR: MIN. 250%
   } at $I_F$=1mA
2. Visible light cut-off type: GP1L01F

### ■ Applications

1. Record players, cassette decks
2. Copiers, printers, facsimiles
3. Telephone sets
4. Fan heaters, electronic sewing machines

### ■ 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 | $I_C$ | 40 | 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 | — | 3.0 | 4.0 | V |
| | Reverse current | | $I_R$ | $V_R$=3V | — | — | 10 | μA |
| Output | Collector dark current | | $I_{CEO}$ | $V_{CE}$=10V | — | — | $10^{-6}$ | A |
| Transfer characteristics | Current transfer ratio | GP1L01 | CTR | $I_F$=1mA, $V_{CE}$=2V | 300 | 1,000 | — | % |
| | | GP1L01F | | | 250 | 1,000 | — | % |
| | Collector-emitter saturation voltage | | $V_{CE(sat)}$ | $I_F$=2mA, $I_C$=1.5mA | — | — | 1.0 | V |
| | Response time (Rise) | | $t_r$ | $I_C$=10mA, $V_{CE}$=2V, $R_L$=100Ω | — | 80 | 400 | μs |
| | Response time (Fall) | | $t_f$ | | — | 70 | 350 | μs |

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

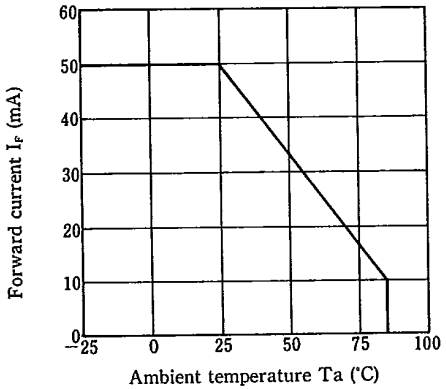



**Fig. 2 Collector Power Dissipation vs. Ambient Temperature**

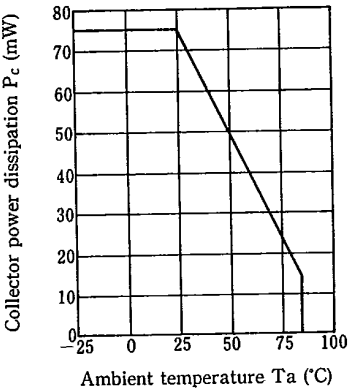



**Fig. 3 Peak Forward Current vs. Duty Ratio**

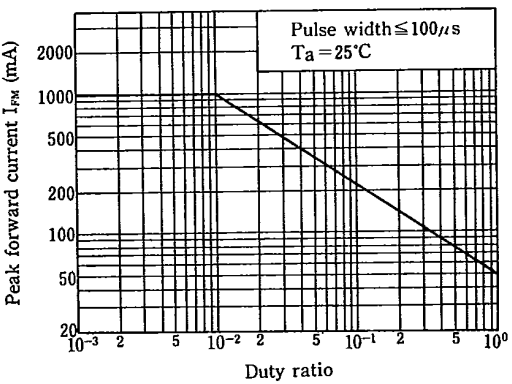



**Fig. 4 Forward Current vs. Forward Voltage**

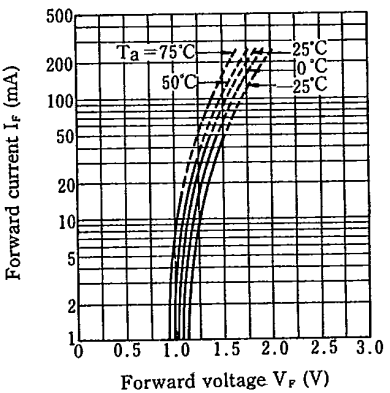


**Fig. 5 Collector Current vs. Forward Current**

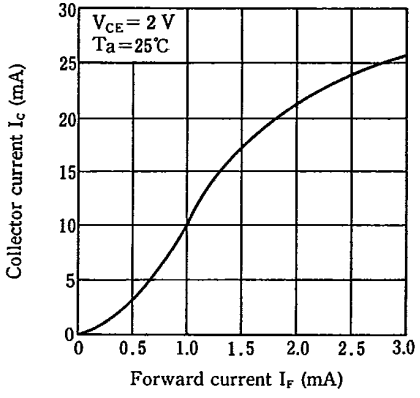



**Fig. 6 Collector Current vs. Collector-emitter Voltage**

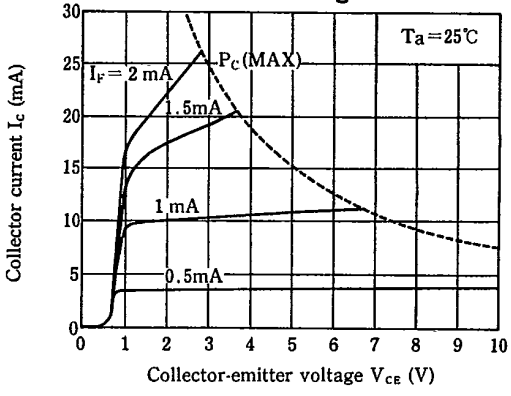



**Fig. 7 Collector Current vs. Ambient Temperature**

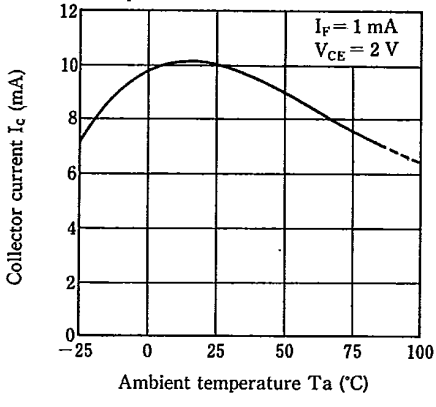



**Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature**

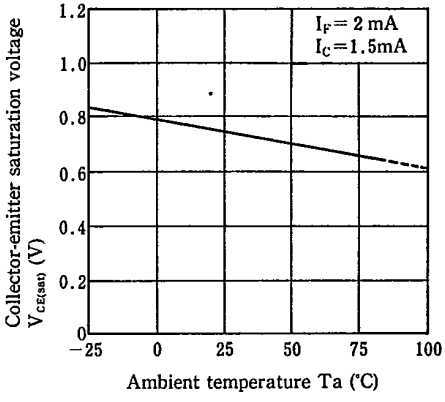
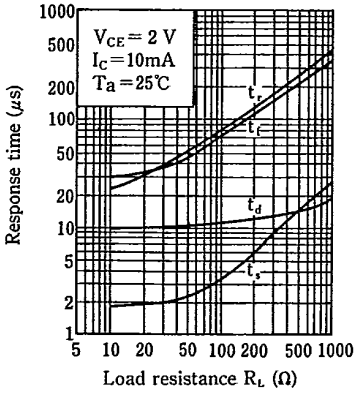
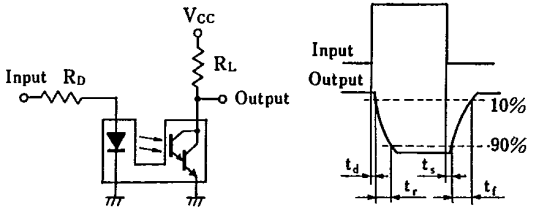


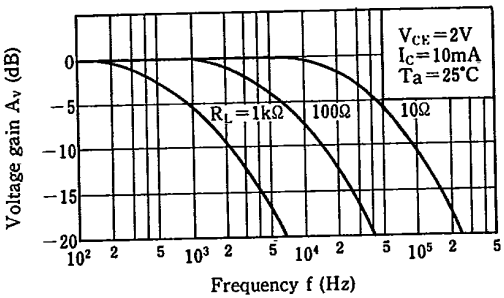

**Fig. 9 Response Time vs. Load Resistance**



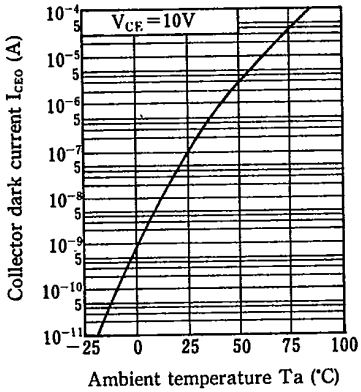

Test Circuit for Response Time



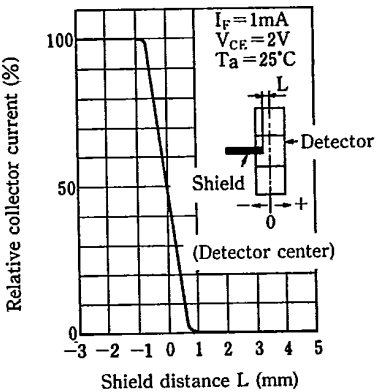
## Fig. 10 Frequency Response



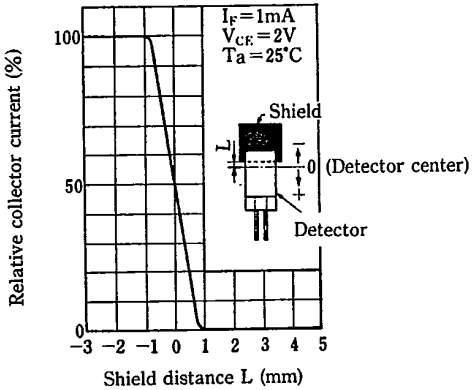

## Fig. 11 Collector Dark Current vs. Ambient Temperature



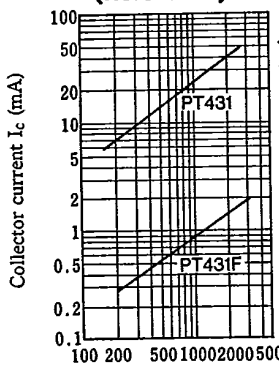

## Fig. 12 Relative Collector Current vs. Shield Distance (1)




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




## Fig. 14 Collector Current vs. Illuminance (Reference)




Test Condition
Light source:
White fluorescent lamp
Sharp FLR-40SW/M
$V_{CE}$=2V, Ta=25°C

(Note) Comparison between outputs of transparent resin molded type phototransistor (PT431) and visible light cut-off resin molded type (PT431F)