

# Reflective photosensor (photoreflector)

## RPR-359F

The RPR-359F is a reflective photosensor. The emitter is a GaAs infrared light emitting diode and the detector is a high-sensitivity, silicon planar phototransistor. A plastic lens is used for high sensitivity. In addition, since it is molded in plastic with a visible light filter, there is almost no effect from stray light.

### ●Applications

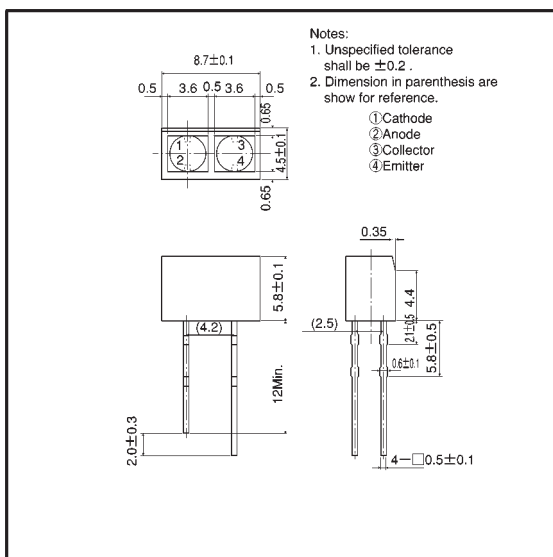
Copiers

Compact disc players

### ●Features

- 1) A plastic lens is used for high sensitivity.
- 2) A built-in visible light filter minimizes the influence of stray light.
- 3) Low collector-emitter saturation voltage.
- 4) Sturdy leads allow easy mounting.
- 5) Lightweight and compact.

### ●External dimensions (Units: mm)



### ●Absolute maximum ratings (Ta = 25°C)

|                           | Parameter                   | Symbol    | Limits          | Unit |
|---------------------------|-----------------------------|-----------|-----------------|------|
| Input(LED)                | Forward current             | $I_F$     | 50              | mA   |
|                           | Reverse voltage             | $V_R$     | 5               | V    |
|                           | Power dissipation           | $P_D$     | 80              | mW   |
| Output (photo-transistor) | Collector-emitter voltage   | $V_{CEO}$ | 30              | V    |
|                           | Emitter-collector voltage   | $V_{ECO}$ | 4.5             | V    |
|                           | Collector current           | $I_C$     | 30              | mA   |
|                           | Collector power dissipation | $P_C$     | 100             | mW   |
| Operating temperature     |                             | $T_{opr}$ | $-25 \sim +85$  | °C   |
| Storage temperature       |                             | $T_{stg}$ | $-40 \sim +100$ | °C   |

●Electrical and optical characteristics (Ta = 25°C)

| Parameter                |                                      | Symbol               | Min. | Typ. | Max. | Unit          | Conditions                                                                  |
|--------------------------|--------------------------------------|----------------------|------|------|------|---------------|-----------------------------------------------------------------------------|
| Input characteristics    | Forward voltage                      | $V_F$                | —    | 1.3  | 1.6  | V             | $I_F=50\text{mA}$                                                           |
|                          | Reverse current                      | $I_R$                | —    | —    | 10   | $\mu\text{A}$ | $V_R=5\text{V}$                                                             |
| Output characteristics   | Dark current                         | $I_{CEO}$            | —    | —    | 0.5  | $\mu\text{A}$ | $V_{CE}=10\text{V}$                                                         |
|                          | Peak sensitivity wavelength          | $\lambda_P$          | —    | 800  | —    | nm            | —                                                                           |
| Transfer characteristics | Collector current                    | $I_{C^*}$            | 200  | 500  | 1800 | $\mu\text{A}$ | $V_{CC}=5\text{V}$ , $I_F=20\text{mA}$ , $R_L=100\Omega$ , $d=3.5\text{mm}$ |
|                          | Collector-emitter saturation voltage | $V_{CE(\text{sat})}$ | —    | 0.1  | 0.3  | V             | $I_F=20\text{mA}$ , $I_C=100\mu\text{A}$                                    |
|                          | Response time                        | $t_r \cdot t_f$      | —    | 10   | —    | $\mu\text{s}$ | $V_{CC}=10\text{V}$ , $I_F=20\text{mA}$ , $R_L=100\Omega$                   |

\* Standard paper (90%reflection)

●Electrical and optical characteristic curves

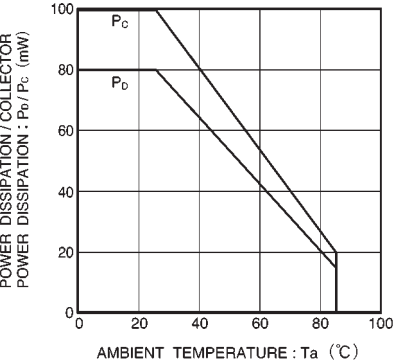


Fig.1 Power dissipation / collector power dissipation vs. ambient temperature

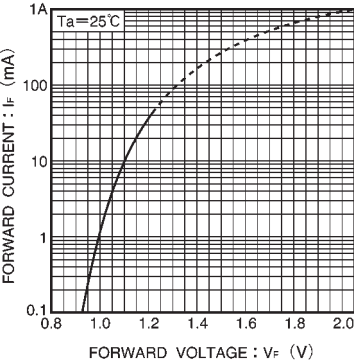


Fig.2 Forward current vs. forward voltage

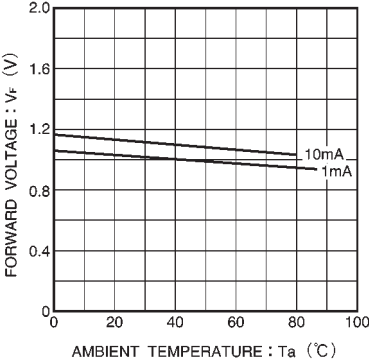


Fig.3 Forward voltage vs. ambient temperature

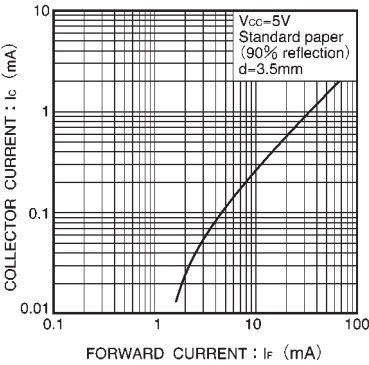


Fig.4 Collector current vs. forward current

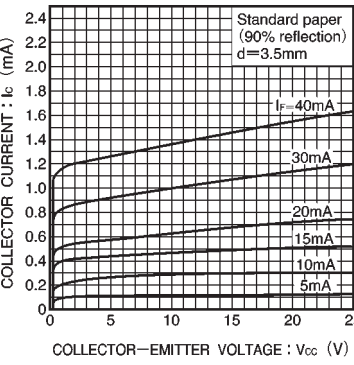


Fig.5 Output characteristics

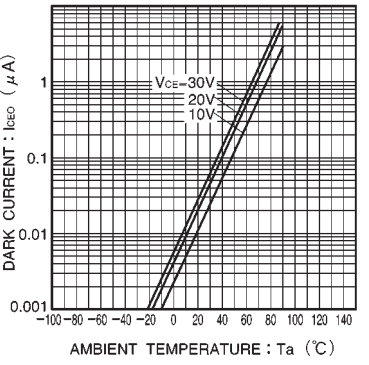


Fig.6 Dark current vs. ambient temperature

Reflective photosensor Cphotorelector

Photo transistor output

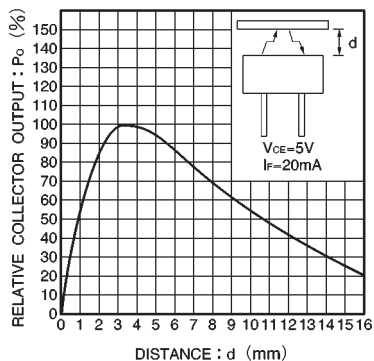


Fig.7 Relative output vs. distance

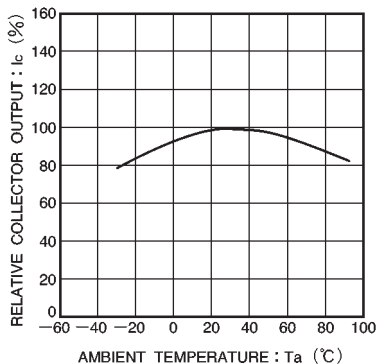


Fig.8 Relative output vs. ambient temperature

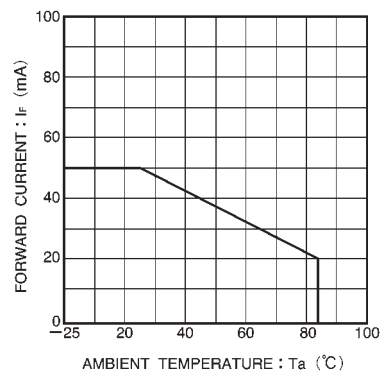


Fig.9 Forward current vs. ambient temperature

#### ● Circuit for testing transfer characteristics

