

# Reflective photosensor (photoreflector)

## RPR-220

The RPR-220 is a reflective photosensor. The emitter is a GaAs infrared light emitting diode and the detector is a high-sensitivity, silicon planar phototransistor. A custom lamp was developed to enable the achievement of a smaller package than with conventional reflectors.

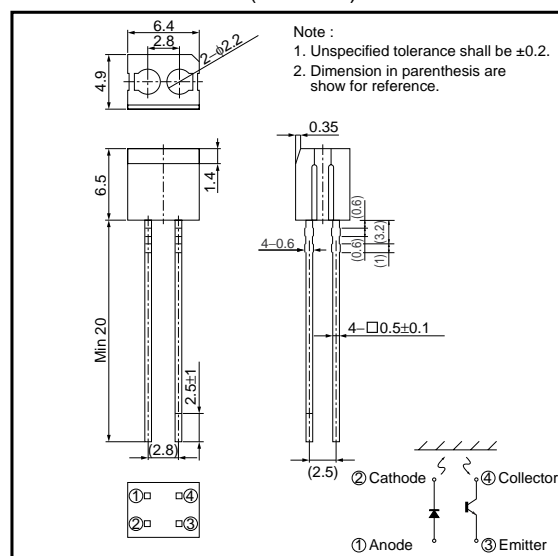
### ●Application

Compact disc players, Copiers, Game machines, Office automation equipment

### ●Features

- 1) A plastic lens is used for high sensitivity.
- 2) A built-in visible light filter minimizes the influence of stray light.
- 3) Lightweight and compact.

### ●External dimensions (Unit : 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 | $P_C$     | 80      | mW   |
| Operating temperature     |                             | $T_{opr}$ | -25~+85 | °C   |
| Storage temperature       |                             | $T_{stg}$ | -30~+85 | °C   |

Sensors

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

| Parameter                |                                      | Symbol               | Min. | Typ. | Max. | Unit          | Conditions  |
|--------------------------|--------------------------------------|----------------------|------|------|------|---------------|---|
| Input characteristics    | Forward voltage                      | $V_F$                | -    | 1.34 | 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                    | $I_C$                | 0.08 | 0.3  | 0.8  | mA            | $V_{CE}=2\text{V}, I_F=10\text{mA}$                 |
|                          | Collector-emitter saturation voltage | $V_{CE(\text{sat})}$ | -    | 0.1  | 0.3  | V             | $I_F=20\text{mA}, I_C=0.1\text{mA}$                 |
|                          | Response time                        | tr-tf                | -    | 10   | -    | $\mu\text{s}$ | $V_{CC}=10\text{V}, I_F=20\text{mA}, R_L=100\Omega$ |

●Electrical and optical characteristic curves

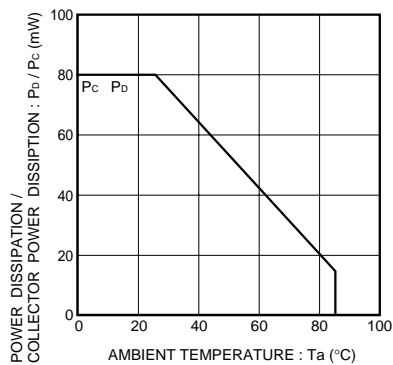


Fig.1 Power dissipation / collector power dissipation vs. ambient temperature

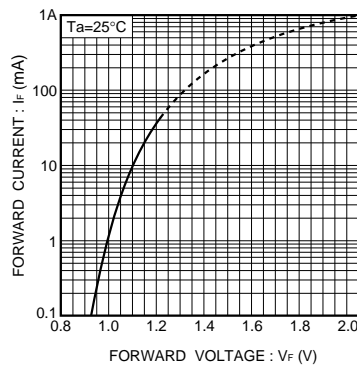


Fig.2 Forward current vs. forward voltage

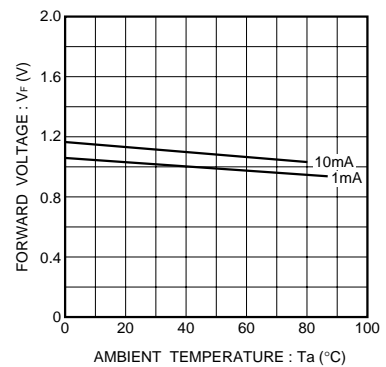


Fig.3 Forward voltage vs. ambient temperature

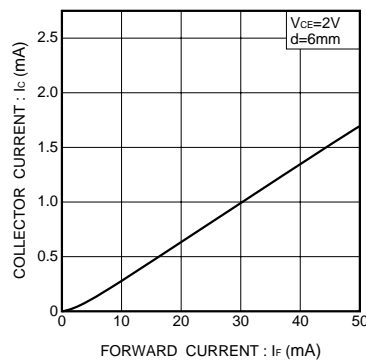


Fig.4 Collector current vs. forward current

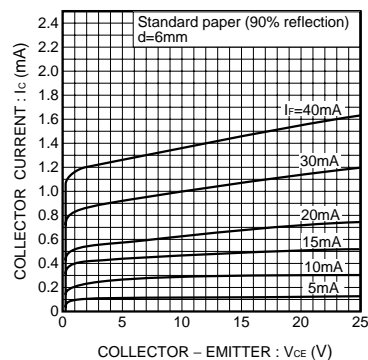


Fig.5 Output characteristics

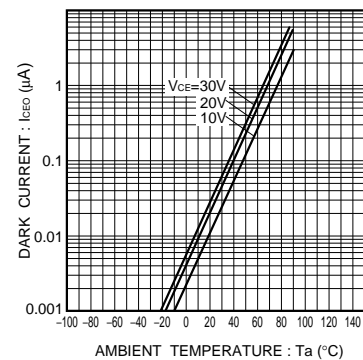


Fig.6 Dark current vs. ambient temperature

Sensors

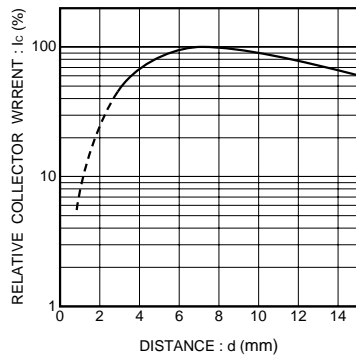


Fig.7 Relative output vs. distance

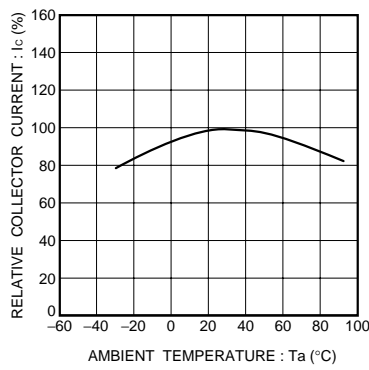


Fig.8 Relative output vs. ambient temperature

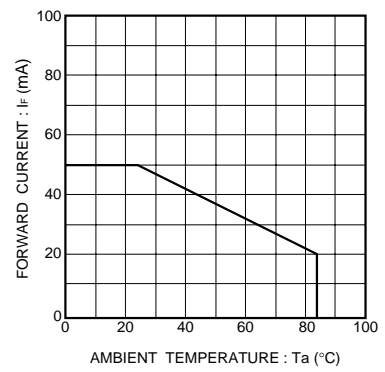
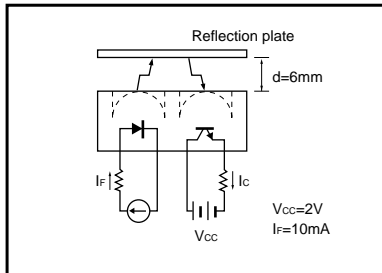


Fig.9 Forward current vs. ambient temperature

●Circuit for testing transfer characteristics



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