

Photointerrupter, Ultraminiature type

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 to +85  | °C   |
| Storage temperature       |                             | $T_{stg}$ | -40 to +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                    | $I_{C1}$      | 0.7  | -    | -    | mA            | $V_{CE} = 5\text{V}, I_F = 20\text{mA}$                                                                                                 |
|                              |                                      | $I_{C2}$      | 0.2  | -    | -    | mA            | $V_{CE} = 5\text{V}, I_F = 5\text{mA}$                                                                                                  |
|                              | Collector-emitter saturation voltage | $V_{CE(sat)}$ | -    | -    | 0.3  | V             | $I_F = 20\text{mA}, I_C = 0.3\text{mA}$                                                                                                 |
| Infrared light-emitter diode | Response time                        | $t_r + t_f$   | -    | 10   | -    | $\mu\text{s}$ | $V_{CC} = 5\text{V}, I_F = 20\text{mA}, R_L = 100\Omega$                                                                                |
|                              | Cut-off frequency                    | $f_c$         | -    | 1    | -    | MHz           | $I_F = 50\text{mA}$<br>* Non-coherent Infrared light emitting diode used.                                                               |
| Photo transistor             | Response time                        | $t_r + t_f$   | -    | 10   | -    | $\mu\text{s}$ | $V_{CC} = 5\text{V}, I_C = 1\text{mA}, R_L = 100\Omega$<br>* This product is not designed to be protected against electromagnetic wave. |
|                              | Maximum sensitivity wavelength       | $\lambda_P$   | -    | 800  | -    | nm            | -                                                                                                                                       |

Electrical and optical characteristics curves

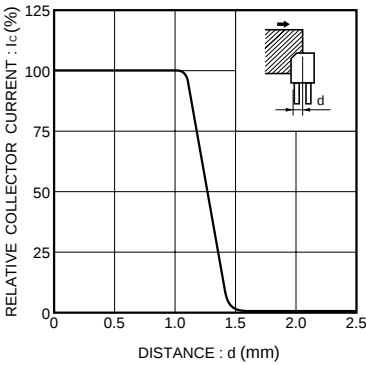


Fig.1 Relative output current vs. distance (I)

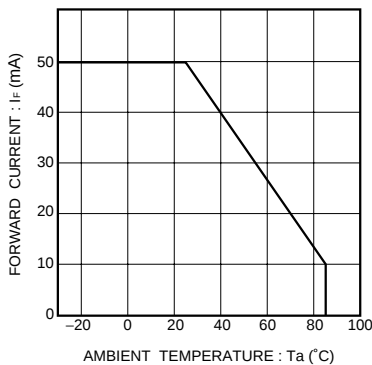


Fig.2 Forward current falloff

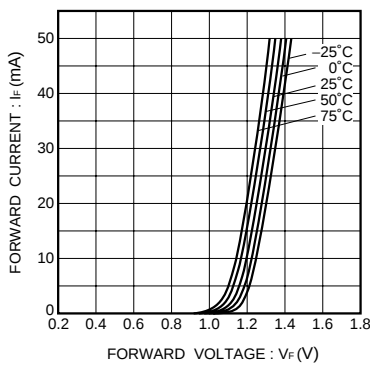


Fig.3 Forward current vs. forward voltage

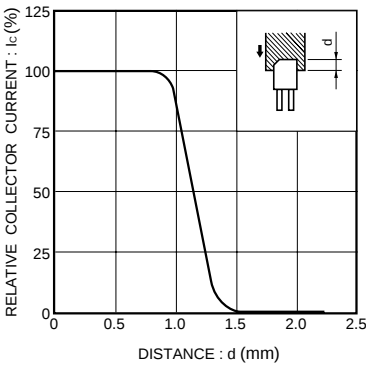


Fig.4 Relative output current vs. distance (II)

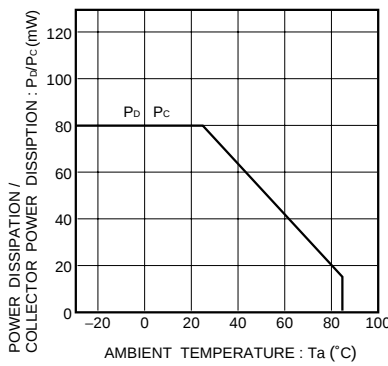


Fig.5 Power dissipation / collector power dissipation vs. ambient temperature

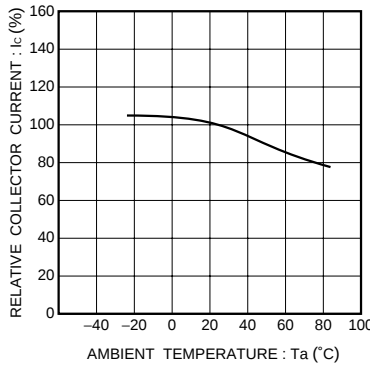


Fig.6 Relative output vs. ambient temperature

External dimensions (Unit : mm)

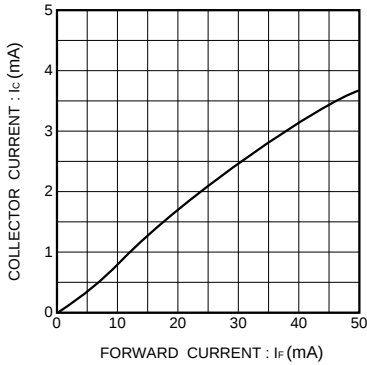
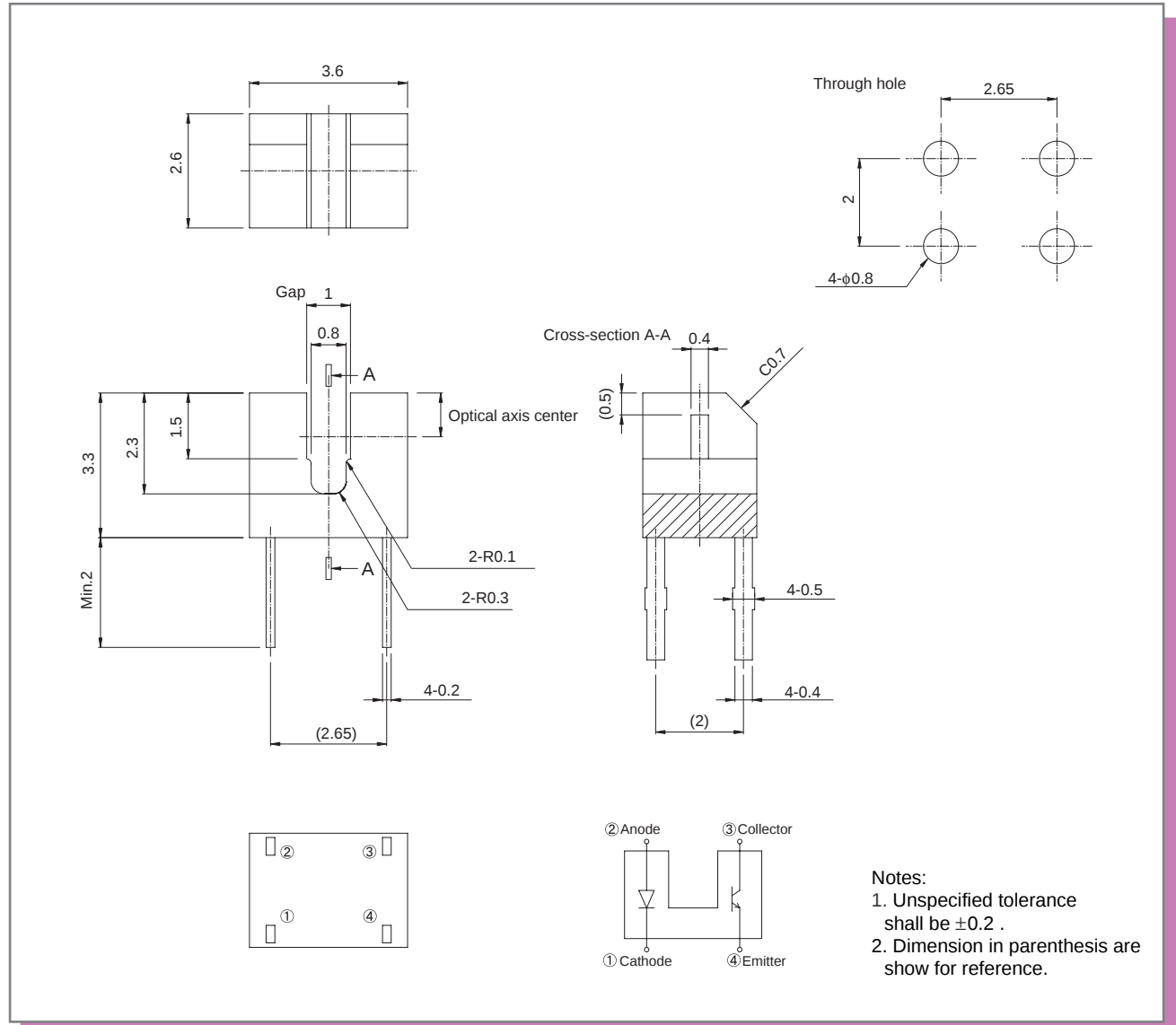


Fig.7 Collector current vs. forward current

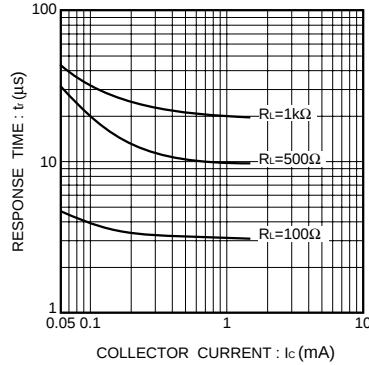


Fig.8 Response time vs. collector current

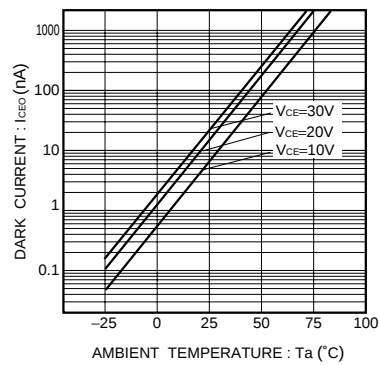


Fig.9 Dark current vs. ambient temperature

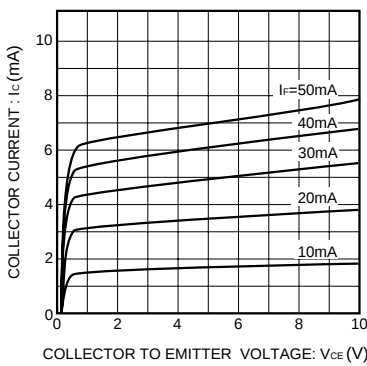


Fig.10 Output characteristics

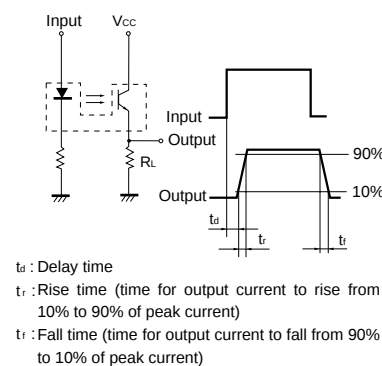


Fig.11 Response time measurement circuit

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