# Photointerrupter, double-layer mold type

## RPI-221

The RPI-221 is an ultra-small size, double–layer mold photointerrupter.

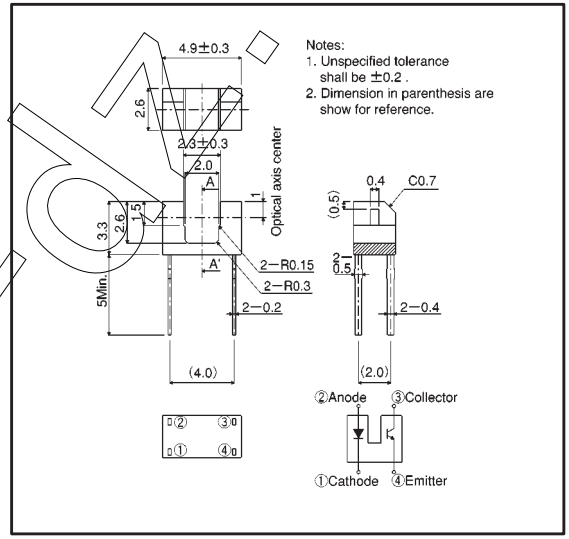
●Applications

Optical control equipment
Cameras
Floppy disk drives

●Features

1) Ultra-small.
2) Minimal influence from stray light.
3) Low collector-emitter saturation voltage.

●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 | $P_C$ | 80 | mW |
| Operating temperature | | Topr | −25～+85 | ℃ |
| Storage temperature | | Tstg | −30～+85 | ℃ |

●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 | $I_F$=50mA |
| | Reverse current | $I_R$ | — | — | 10 | μA | $V_R$=5V |
| Output characteristics | Dark current | $I_{CEO}$ | — | — | 0.5 | μA | $V_{CE}$=10V |
| | Peak sensitivity wavelength | $\lambda_P$ | — | 800 | — | nm | — |
| Transfer characteristics | Collector current | $I_C$ | 0.2 | 1.0 | — | mA | $V_{CE}$=5V, $I_F$=20mA |
| | Collector-emitter saturation voltage | $V_{CE(sat)}$ | — | — | 0.4 | V | $I_F$=20mA, $I_C$=0.1mA |
| | Response time | tr・tf | — | 10 | — | μs | $V_{CC}$=5V, $I_F$=20mA, $R_L$=100Ω |

●Electrical and optical characteristic curves

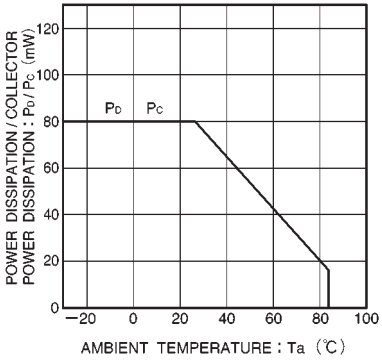



Fig.1 Power dissipation / collector power dissipation vs. ambient temperature

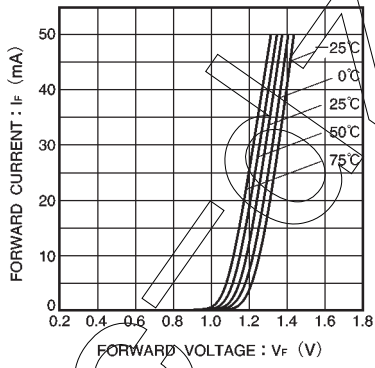



Fig.2 Forward current vs. forward voltage

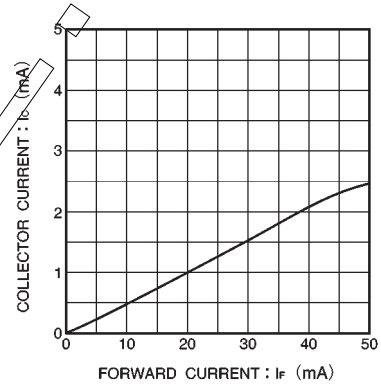



Fig.3 Collector current vs. forward current

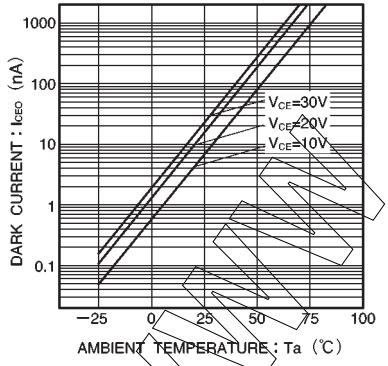



Fig.4 Dark current vs. ambient temperature

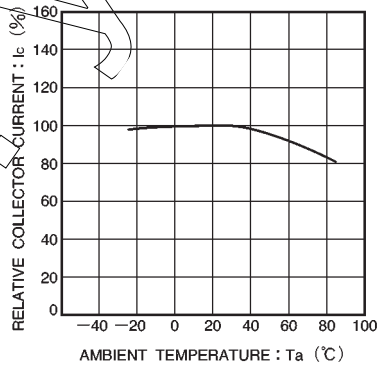



Fig.5 Relative output vs. ambient temperature

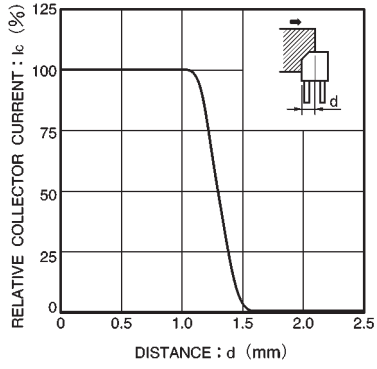



Fig.6 Relative output vs. distance (I)

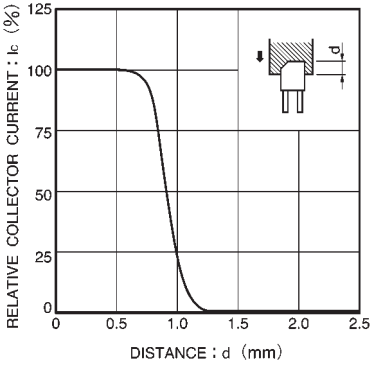



Fig.7 Relative output vs. distance (Ⅱ)

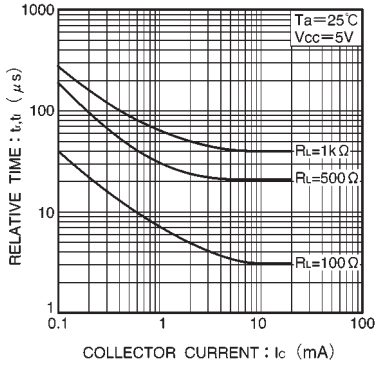



Fig.8 Response time vs. output current

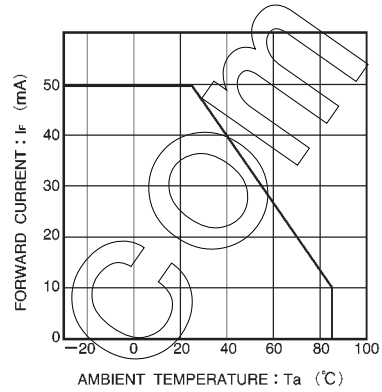



Fig.9 Forward current falloff

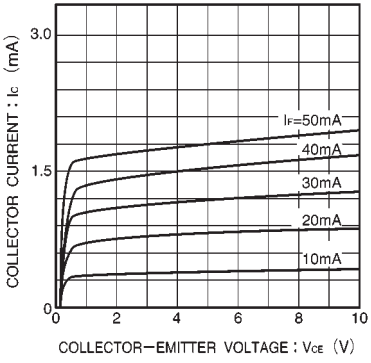
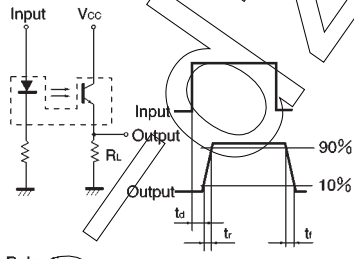



Fig.10 Output characteristics




td : Delay time
tr : Rise time (time for output current to rise from 10% to 90% of peak current)
tf : Fall time (time for output current to fall from 90% to 10% of peak current)

Fig.11 Response time measurement circuit

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