

ON1003

Photo Interrupter

For contactless SW, object detection

Outline

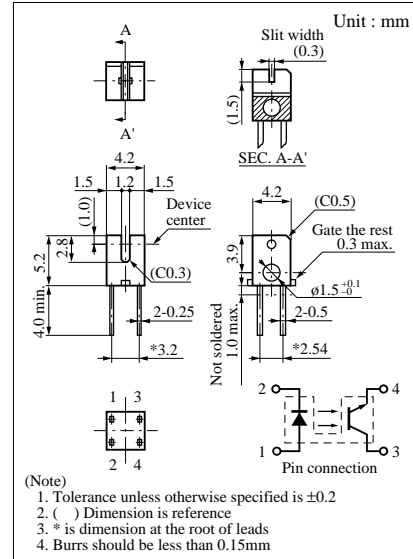
ON1003 is an ultraminiature, highly reliable transmissive photosensor in which a high efficiency GaAs infrared light emitting diode chip and a high sensitivity Si phototransistor chip are integrated in a double molded resin package.

Features

- Ultraminiature : 4.2 × 4.2 mm (height : 5.2 mm)
- Fast response : $t_r, t_f = 35 \mu s$ (typ.)
- Highly precise position detection : 0.15 mm
- Gap width : 1.2 mm

Absolute Maximum Ratings (Ta = 25°C)

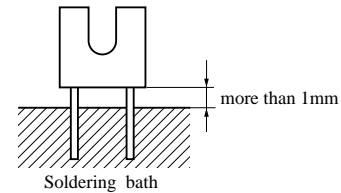
| | Parameter | Symbol | Ratings | Unit |
|------------------------------|-------------------------------|----------------|-------------|------|
| Input (Light emitting diode) | Reverse voltage (DC) | V_R | 6 | V |
| | Forward current (DC) | I_F | 50 | mA |
| | Power dissipation | P_D^{*1} | 75 | mW |
| Output (Photo transistor) | Collector current | I_C | 20 | mA |
| | Collector to emitter voltage | V_{CEO} | 35 | V |
| | Emitter to collector voltage | V_{ECO} | 6 | V |
| | Collector power dissipation | P_C^{*2} | 75 | mW |
| Temperature | Operating ambient temperature | T_{opr} | -25 to +85 | °C |
| | Storage temperature | T_{stg} | -40 to +100 | °C |
| | Soldering temperature | T_{sol}^{*3} | 260 | °C |



*1 Input power derating ratio is 1.0mW/°C at Ta \geq 25°C.

*2 Output power derating ratio is 1.0mW/°C at Ta \geq 25°C.

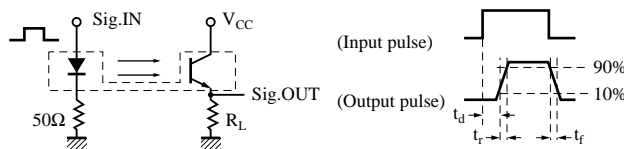
*3 Soldering time is within 5 seconds.



Electrical Characteristics (Ta = 25°C)

| | Parameter | Symbol | Conditions | min | typ | max | Unit |
|--------------------------|---|---------------|--|-----|-----|------|---------|
| Input characteristics | Forward voltage (DC) | V_F | $I_F = 20mA$ | | 1.2 | 1.4 | V |
| | Reverse current (DC) | I_R | $V_R = 3V$ | | | 10 | μA |
| Output characteristics | Collector cutoff current | I_{CEO} | $V_{CE} = 20V$ | | | 100 | nA |
| Transfer characteristics | Collector current | I_C | $V_{CE} = 5V, I_F = 5mA$ | 100 | | 1300 | μA |
| | Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_F = 10mA, I_C = 50\mu A$ | | | 0.4 | V |
| | Response time | t_r, t_f^* | $V_{CC} = 5V, I_C = 0.1mA, R_L = 1000\Omega$ | | 35 | | μs |

* Switching time measurement circuit



t_d : Delay time

t_r : Rise time (Time required for the collector current to increase from 10% to 90% of its final value)

t_f : Fall time (Time required for the collector current to decrease from 90% to 10% of its initial value)

