

# ON1003

## Photo Interrupter

For contactless SW, object detection

### Outline

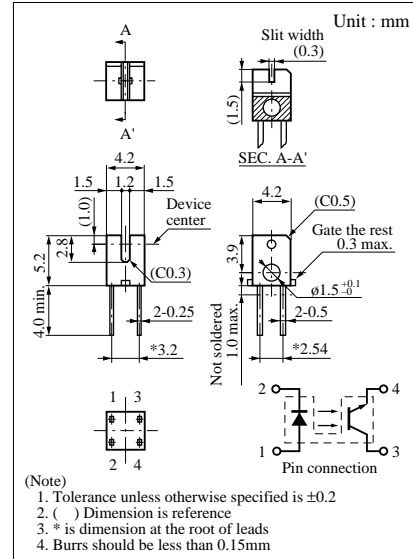
ON1003 is an ultraminiature, highly reliable transmissive photosensor in which a high efficiency GaAs infrared light emitting diode chip and a high sensitivity Si phototransistor chip are integrated in a double molded resin package.

### 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)

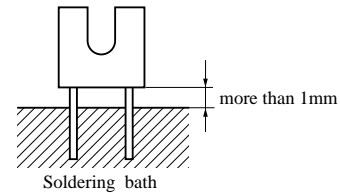
	Parameter	Symbol	Rated	Unit
Input (Light emitting diode)	Reverse voltage (DC)	$V_R$	6	V
	Forward current (DC)	$I_F$	50	mA
	Power dissipation	$P_D^{*1}$	75	mW
Output (Photo transistor)	Collector current	$I_C$	20	mA
	Collector to emitter voltage	$V_{CEO}$	35	V
	Emitter to collector voltage	$V_{ECO}$	6	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.

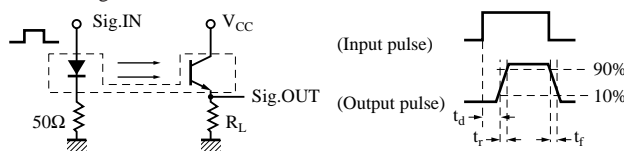
\*3 Soldering time is within 5 seconds.



### 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	$\mu A$
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	$\mu A$
	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		$\mu s$

\* 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)

