

# CNZ1002 (ON1002)

## Photo Interrupter

For contactless SW, object detection

### Overview

CNZ1002 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 : 4.0 × 3.8 mm (height : 5.1 mm)
- Fast response :  $t_r, t_f = 35 \mu s$  (typ.)
- Highly precise position detection : 0.25 mm
- Gap width : 0.9 mm

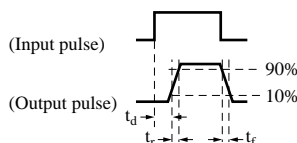
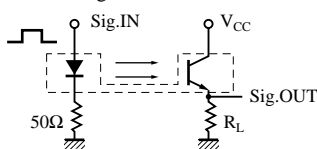
### Absolute Maximum Ratings (Ta = 25°C)

	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

### Electrical Characteristics (Ta = 25°C)

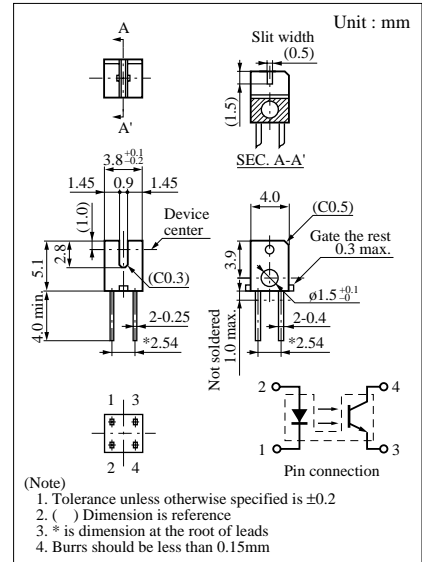
	Parameter	Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	$V_F$	$I_F = 20mA$		1.2	1.4	V
	Reverse current (DC)	$I_R$	$V_R = 3V$			10	$\mu A$
Output characteristics	Collector cutoff current	$I_{CEO}$	$V_{CE} = 20V$			100	nA
Transfer characteristics	Collector current	$I_C$	$V_{CE} = 5V, I_F = 1.5mA$	65		480	$\mu A$
	Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_F = 3mA, I_C = 30\mu A$			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)

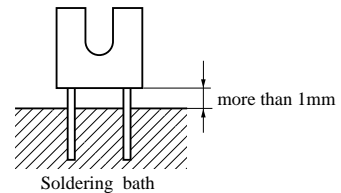
(Note) The part number in the parenthesis shows conventional part number.

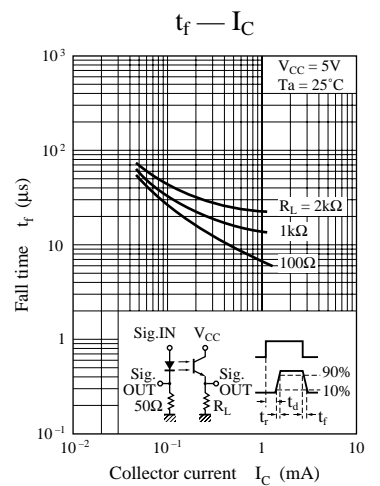
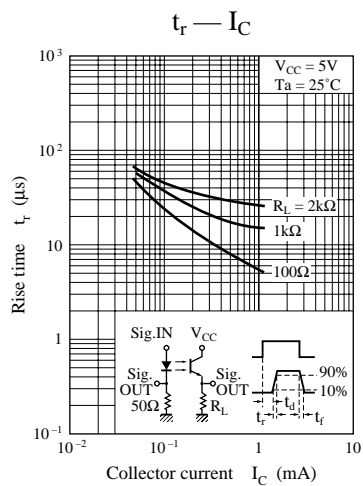
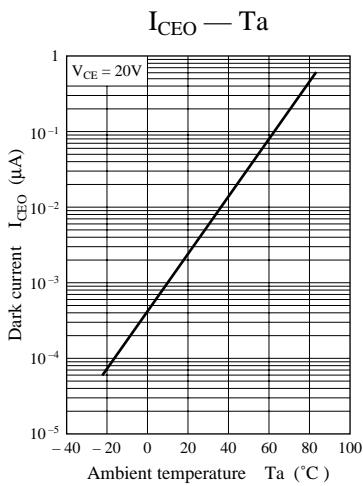
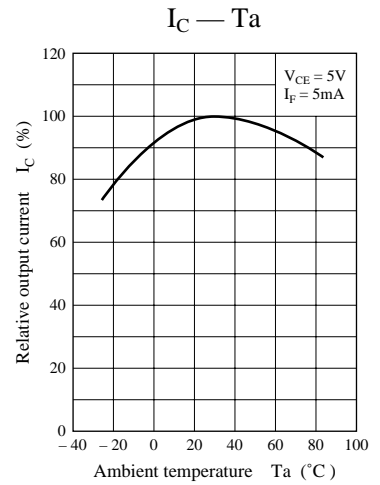
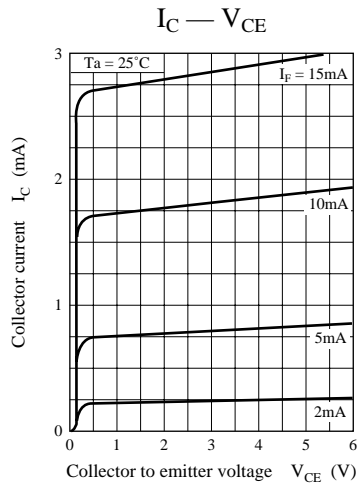
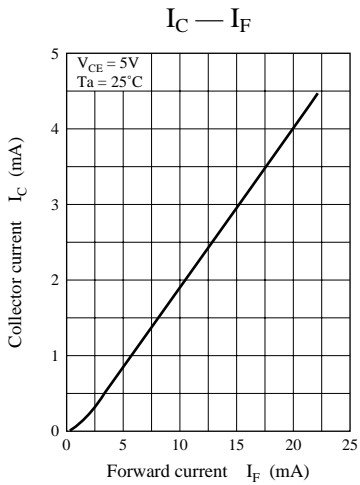
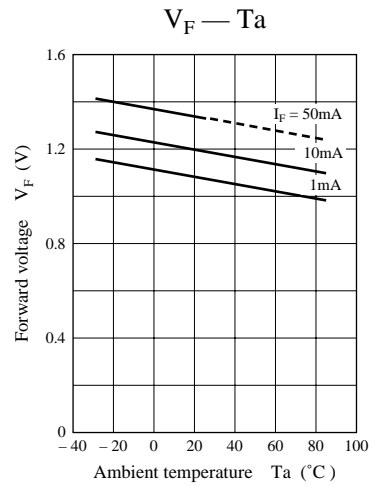
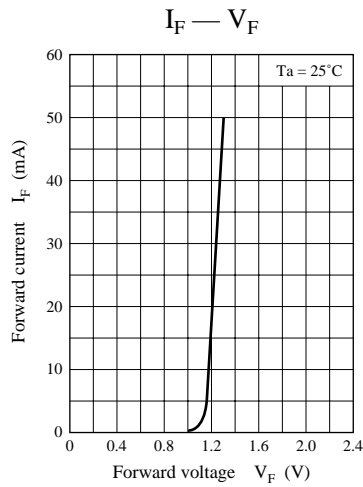
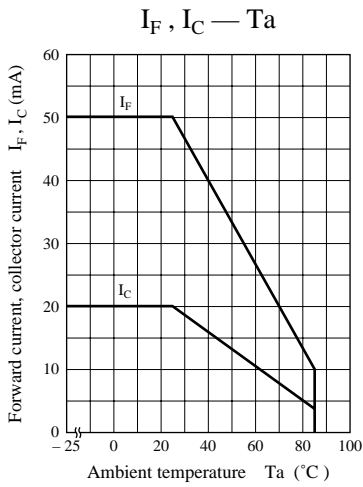


\*1 Input power derating ratio is 1.0mW/°C at Ta ≥ 25°C.

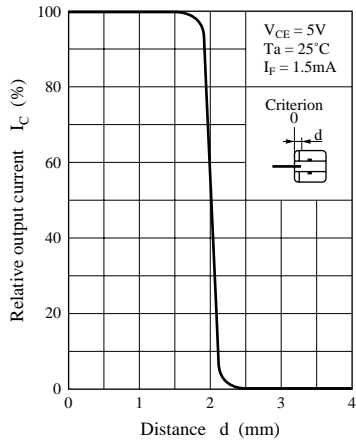
\*2 Output power derating ratio is 1.0mW/°C at Ta ≥ 25°C.

\*3 Soldering time is within 5 seconds.

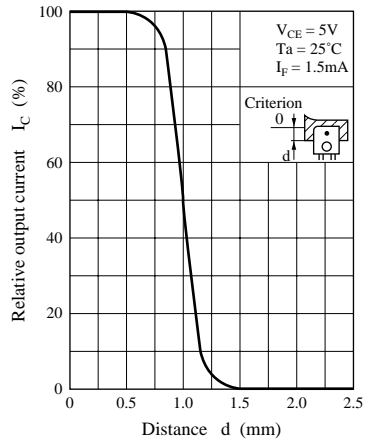




$I_C - d$  (1)



$I_C - d$  (2)



# Caution for Safety

 **DANGER**

Gallium arsenide material (GaAs) is used in this product.

Therefore, do not burn, destroy, cut, crush, or chemically decompose the product, since gallium arsenide material in powder or vapor form is harmful to human health.

Observe the relevant laws and regulations when disposing of the products. Do not mix them with ordinary industrial waste or household refuse when disposing of GaAs-containing products.

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