

# CNZ1021 (ON1021), CNZ1023 (ON1023), CNA1009H (ON1024)

## Photo Interrupter

For contactless SW, object detection

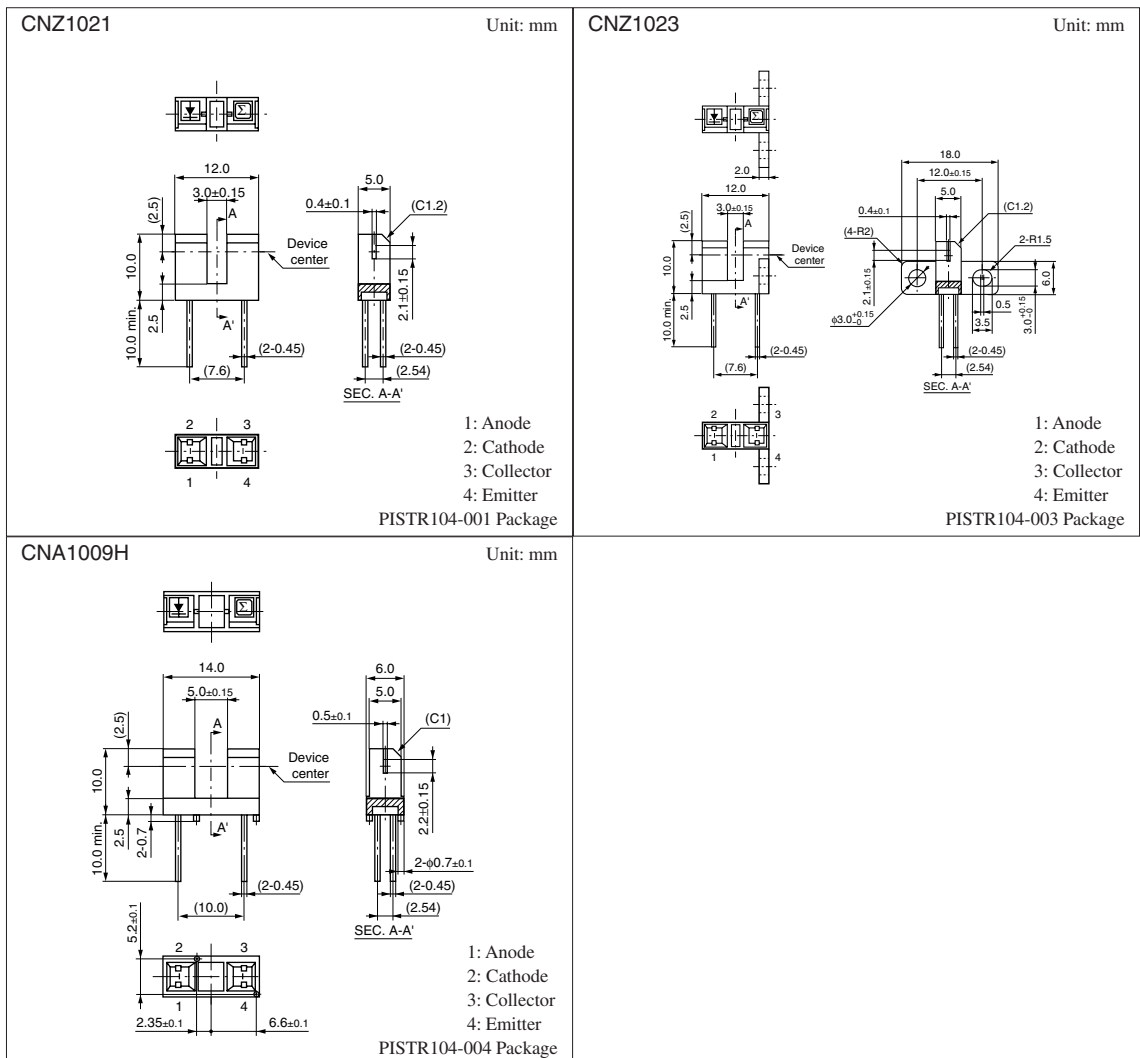
### Overview

CNZ1021, CNZ1023 and CNA1009H are a transmissive photosensor in which a high efficiency GaAs infrared light emitting diode is used as the light emitting element, and a high sensitivity phototransistor is used as the light detecting element. The two elements are arranged so as to face each other, and objects passing between them are detected.

### Features

- Highly precise position detection: 0.25 mm
- Gap width: 3 mm (CNZ1021, CNZ1023)  
5 mm (CNA1009H)
- The type directly attached to PCB ..... CNZ1021  
Screw-fastened type (one side) ..... CNZ1023  
The type directly attached to PCB ..... CNA1009H  
(with a positioning pins)

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(Note) 1. Tolerance unless otherwise specified is  $\pm 0.3$   
2. ( ) Dimension is reference

(Note) The part numbers in the parenthesis show conventional part number.

■ Absolute Maximum Ratings  $T_a = 25^\circ\text{C}$

Parameter		Symbol	Rating	Unit	
Input (Light emitting diode)	Reverse voltage	CNZ1021	$V_R$	3	V
		CNZ1023		3	
		CNA1009H		5	
	Forward current	$I_F$	50	mA	
Power dissipation *1		$P_D$	75	mW	
Output (Photo transistor)	Collector-emitter voltage (Base open)	$V_{CEO}$	30	V	
	Emitter-collector voltage (Base open)	$V_{ECO}$	5	V	
	Collector current	$I_C$	20	mA	
	Collector power dissipation *2	$P_C$	100	mW	
Temperature	Operating ambient temperature	$T_{opr}$	-25 to +85	$^\circ\text{C}$	
	Storage temperature	$T_{stg}$	-40 to +100	$^\circ\text{C}$	

Note) \*1: Input power derating ratio is 1.0 mW/ $^\circ\text{C}$  at  $T_a \geq 25^\circ\text{C}$ .

\*2: Output power derating ratio is 1.33 mW/ $^\circ\text{C}$  at  $T_a \geq 25^\circ\text{C}$ .

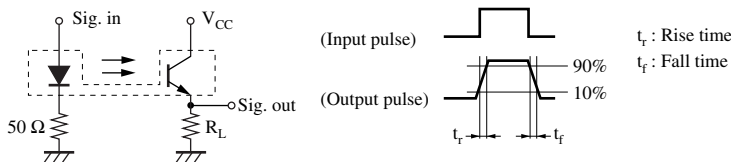
■ Electrical-Optical Characteristics  $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

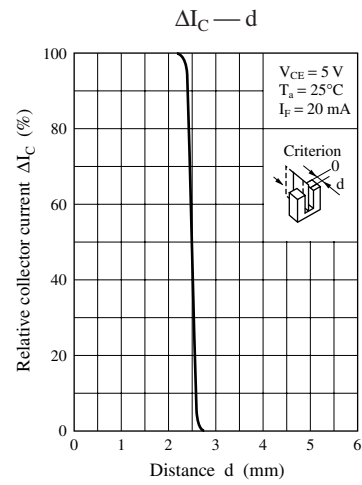
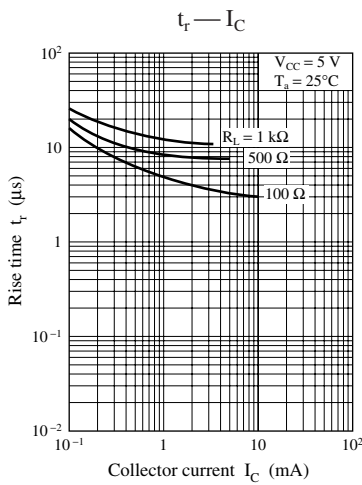
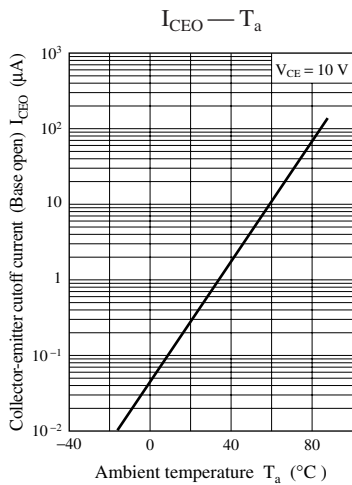
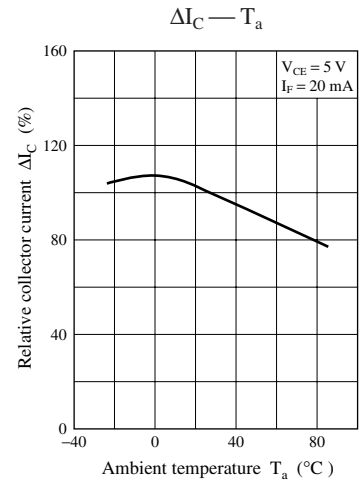
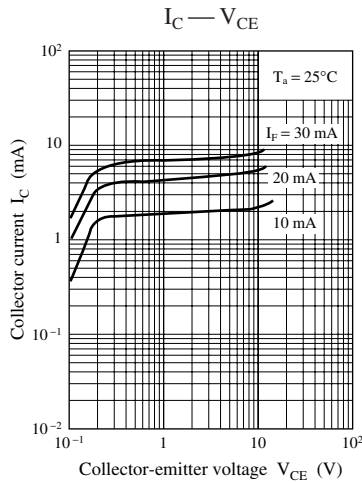
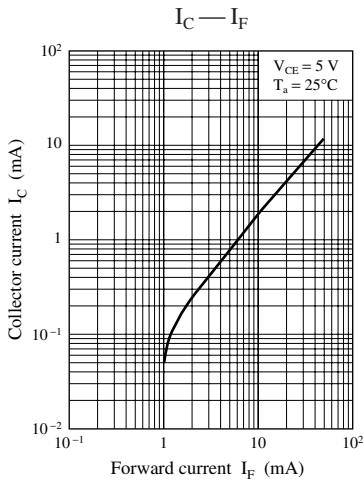
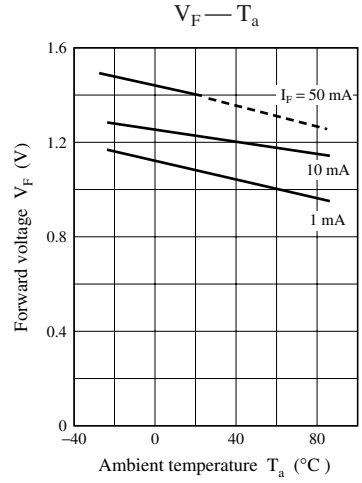
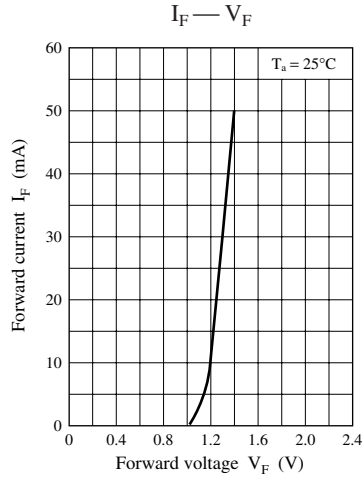
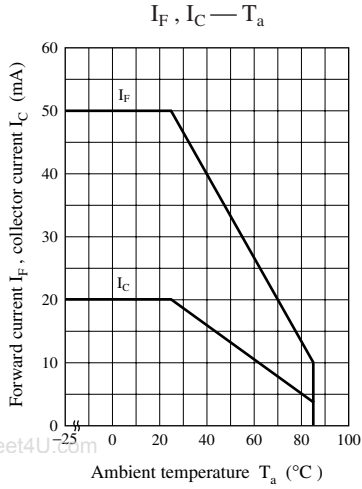
Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Forward voltage	$V_F$	$I_F = 20 \text{ mA}$		1.25	1.40	V
	Reverse current	$I_R$	$V_R = 3 \text{ V}$			10	$\mu\text{A}$
Output characteristics	Collector-emitter cutoff current (Base open)	$I_{CEO}$	$V_{CE} = 10 \text{ V}$		10	200	nA
Transfer characteristics	Collector current	$I_C$	$V_{CC} = 5 \text{ V}, I_F = 20 \text{ mA}, R_L = 100 \Omega$	0.5		15.0	mA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F = 40 \text{ mA}, I_C = 1 \text{ mA}$			0.4	V
	Rise time *	$t_r$	$V_{CC} = 5 \text{ V}, I_C = 1 \text{ mA}$		5		$\mu\text{s}$
	Fall time *	$t_f$	$R_L = 100 \Omega$		5		$\mu\text{s}$

Note) 1. Input and output are practiced by electricity.

2. This device is designed be disregarded radiation.

3. \*: Switching time measurement circuit





# Caution for Safety

 **DANGER**

## ■ This product contains Gallium Arsenide (GaAs).

GaAs powder and vapor are hazardous to human health if inhaled or ingested. Do not burn, destroy, cut, cleave off, or chemically dissolve the product. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.

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