

# CNZ1102 (ON1102), CNZ1108 (ON1108)

## Photo Interrupters

For contactless SW, object detection

### ■ Overview

CNZ1102 and CNZ1108 are a photocoupler 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: 1.2 mm
- Large output current
- Fast response:  $t_r$ ,  $t_f = 4 \mu\text{s}$  (typ.) (CNZ1102)  
6  $\mu\text{s}$  (typ.) (CNZ1108)
- Small output current variation against change in temperature
- Small package used for saving mounting space (CNZ1108)

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

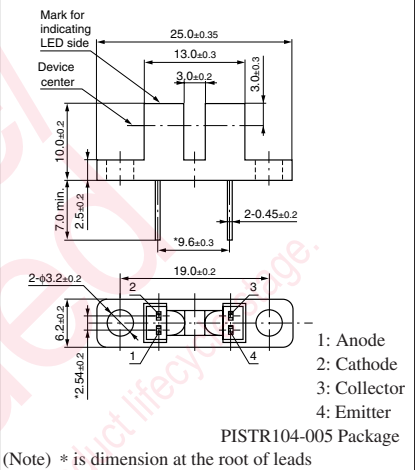
Parameter		Symbol	Rating	Unit
Input (Light emitting diode)	Reverse voltage	$V_R$	3	V
	Forward current	$I_F$	50	mA
	Power dissipation *1	$P_D$	75	mW
Output (Photo transistor)	Collector-emitter voltage (Base open)	$V_{CEO}$	30	V
	Emitter-collector voltage	$V_{ECO}$	5	V
	Collector current	$I_C$	20	mA
	Collector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

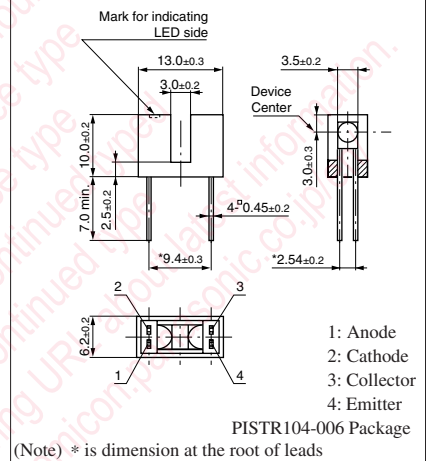
CNZ1102

Unit: mm

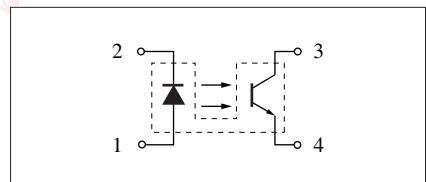


CNZ1108

Unit: mm



### Internal Connection



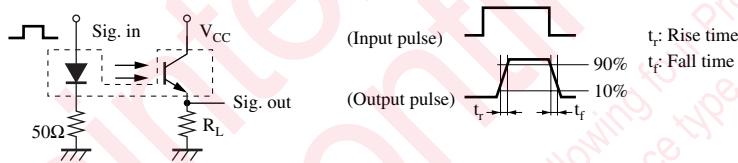
Note) The part numbers in the parenthesis show conventional part number.

■ 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	$V_F$	$I_F = 50\text{ mA}$		1.2	1.5	V	
	Reverse current	$I_R$	$V_R = 3\text{ V}$			10	$\mu\text{A}$	
	Terminal capacitance	$C_t$	$V_R = 0\text{ V}, f = 1\text{ MHz}$		50		pF	
Output characteristics	Collector-emitter cutoff current (Base open)	$I_{CEO}$	$V_{CE} = 10\text{ V}$			200	nA	
	Collector-emitter capacitance	$C_C$	$V_{CE} = 10\text{ V}, f = 1\text{ MHz}$		5		pF	
Transfer characteristics	Collector current *2	$I_C$	$V_{CE} = 10\text{ V}, I_F = 20\text{ mA}$	2.0		20.0	mA	
	Collector-emitter saturation voltage	CNZ1102	$V_{CE(sat)}$ $I_F = 50\text{ mA}, I_C = 1\text{ mA}$			0.4	V	
		CNZ1108		$I_F = 50\text{ mA}, I_C = 0.1\text{ mA}$		0.4		
	Rise time *1	CNZ1102	$t_r$	$V_{CC} = 10\text{ V}, I_C = 5\text{ mA}, R_L = 100\ \Omega$		4.0		$\mu\text{s}$
		CNZ1108		$V_{CC} = 10\text{ V}, I_C = 1\text{ mA}, R_L = 100\ \Omega$		6.0		
	Fall time *1	CNZ1102	$t_f$	$V_{CC} = 10\text{ V}, I_C = 5\text{ mA}, R_L = 100\ \Omega$		4.0		$\mu\text{s}$
CNZ1108		$V_{CC} = 10\text{ V}, I_C = 1\text{ mA}, R_L = 100\ \Omega$			6.0			

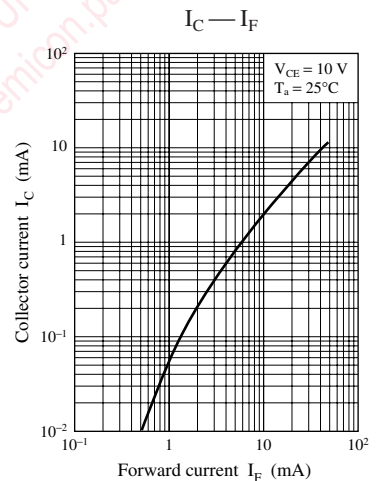
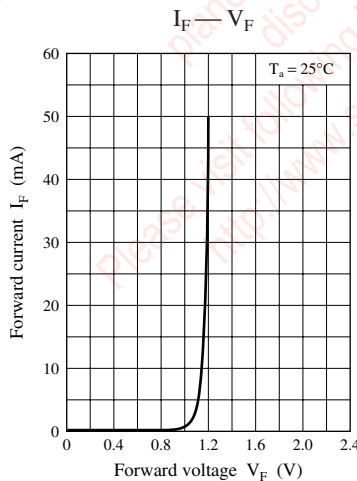
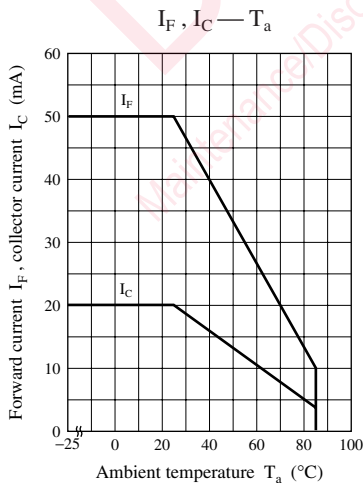
Note) 1. Input and output are practiced by electricity.

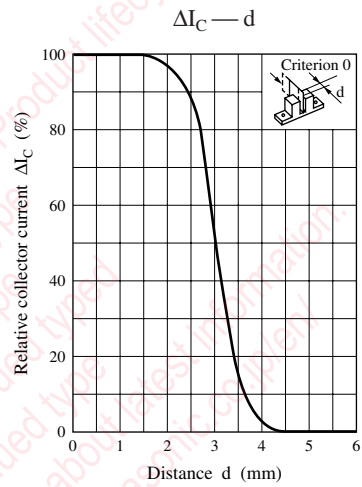
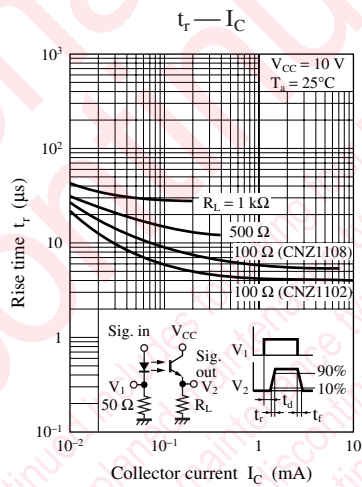
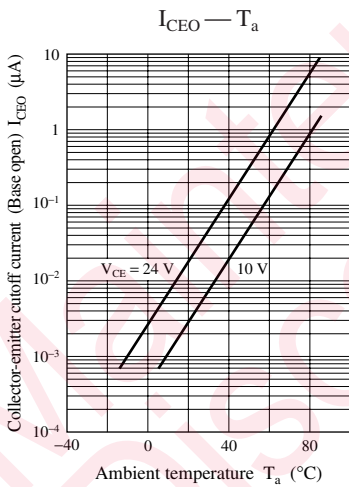
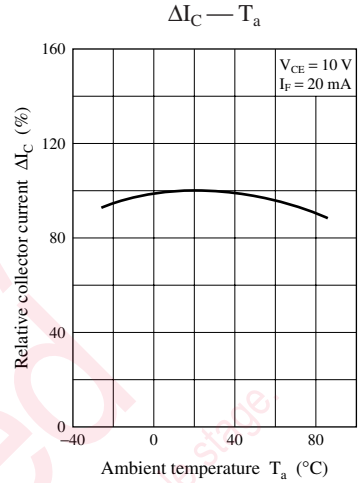
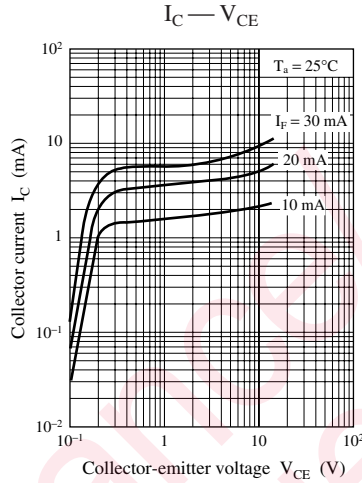
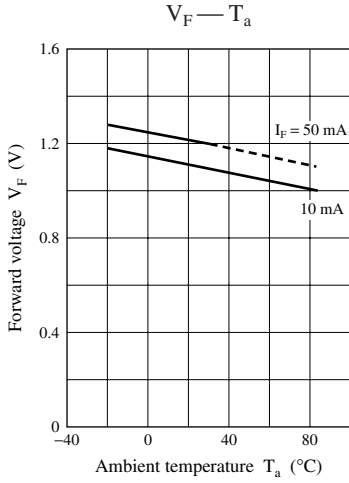
2. This device is designed be disregarded radiation.
3. \*1: Switching time measurement circuit



\*2: Rank classification

Rank	Q	R	S	No-rank
$I_C$ (mA)	2.0 to 5.0	4.0 to 10.0	7.0 to 20.0	> 2.0





# 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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