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

Photo Interrupter

For contactless SW, object detection

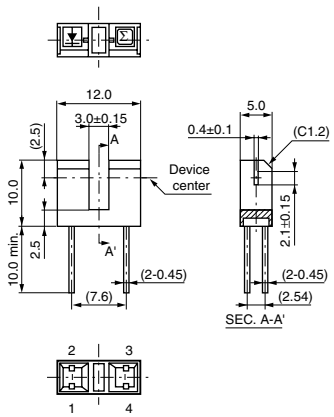
■ Overview

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)

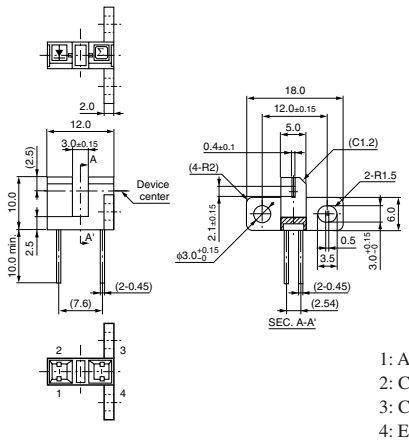
CNZ1021 Unit: mm



1: Anode
2: Cathode
3: Collector
4: Emitter

PISTR104-001 Package

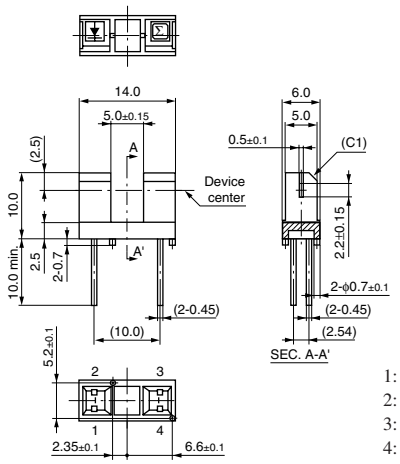
CNZ1023 Unit: mm



1: Anode
2: Cathode
3: Collector
4: Emitter

PISTR104-003 Package

CNA1009H Unit: mm



1: Anode
2: Cathode
3: Collector
4: Emitter

PISTR104-004 Package

(Note) 1. Tolerance unless otherwise specified is ±0.3
2. ( ) Dimension is reference

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

■ Absolute Maximum Ratings $T_a = 25°C$

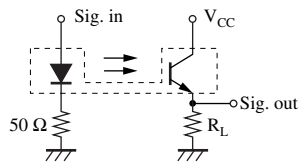
Parameter			Symbol	Rating	Unit
Input (Light emitting diode)	Reverse voltage	CNZ1021	V_R	3	V
		CNZ1023		3	
		CNA1009H		5	
	Forward current		I_F	50	mA
	Power dissipation *1		P_D	75	mW
Output (Photo transistor)	Collector-emitter voltage (Base open)		V_{CEO}	30	V
	Emitter-collector voltage (Base open)		V_{ECO}	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	°C
	Storage temperature		T_{stg}	−40 to +100	°C

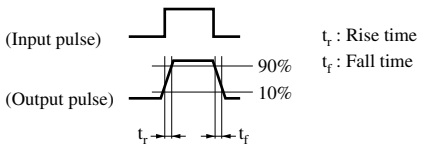
Note) ∗1: Input power derating ratio is 1.0 mW/°C at $T_a \geq 25°C$.
∗2: Output power derating ratio is 1.33 mW/°C at $T_a \geq 25°C$.

■ Electrical-Optical Characteristics $T_a = 25°C \pm 3°C$

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

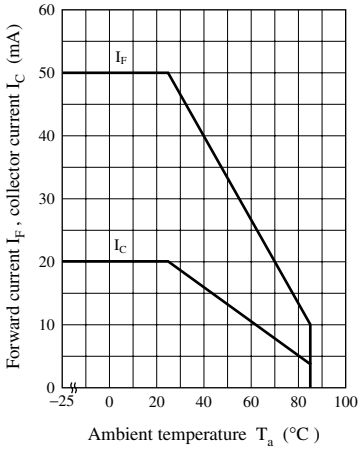
Note) 1. Input and output are practiced by electricity.
2. This device is designed be disregarded radiation.
3. ∗: Switching time measurement circuit



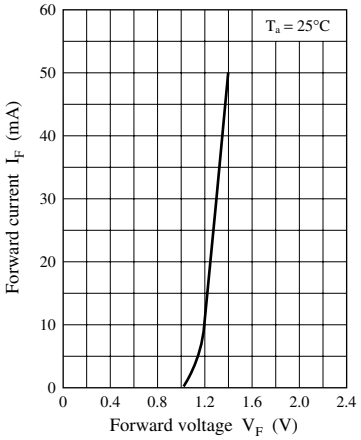


t_r : Rise time
t_f : Fall time

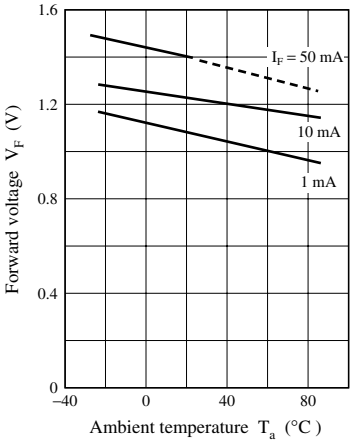
I_F , I_C — T_a



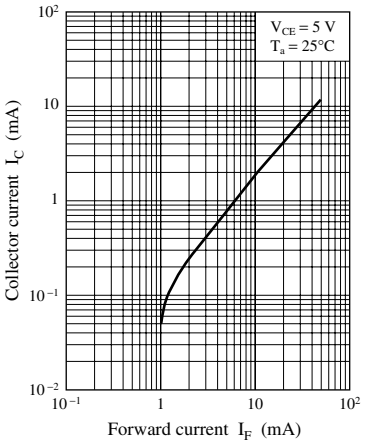
I_F — V_F



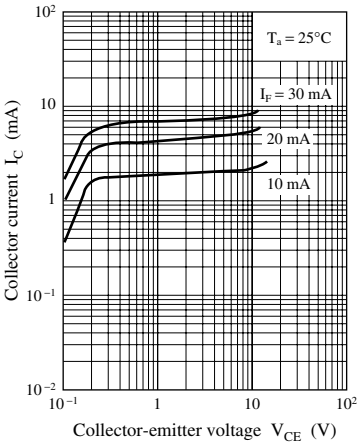
V_F — T_a



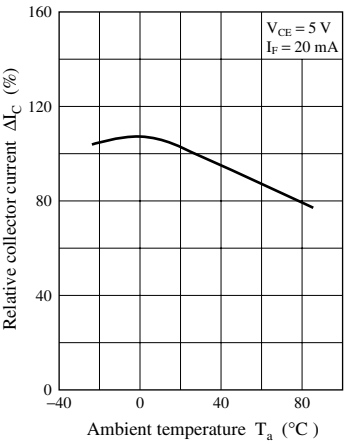
I_C — I_F



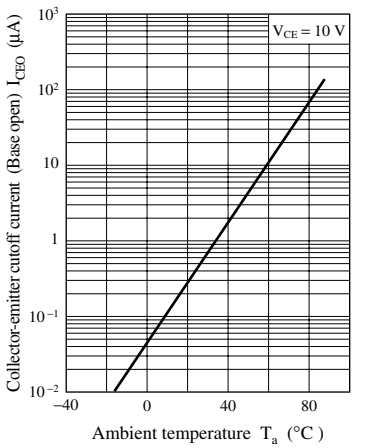
I_C — V_{CE}



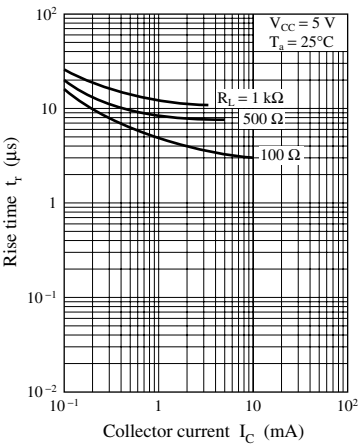
ΔI_C — T_a



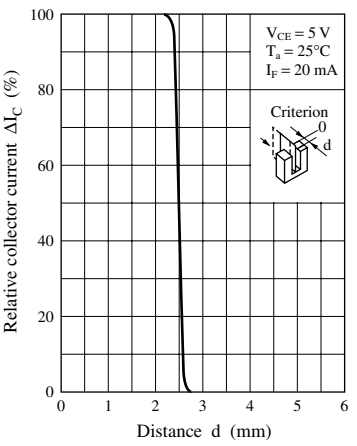
I_{CEO} — T_a



t_r — I_C



ΔI_C — d



⚠ 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 form general industrial waste or household garbage.

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