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

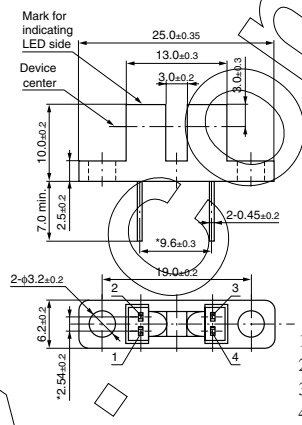
- Highly precise position detection: 1.2 mm
- Large output current
- Fast response: t_r , t_f = 4 µs (typ.) (CNZ1102)
  6 µs (typ.) (CNZ1108)
- Small output current variation against change in temperature
- Small package used for saving mounting space (CNZ1108)

■ Absolute Maximum Ratings T_a = 25°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	°C
	Storage temperature	T_{stg}	−30 to +100	°C

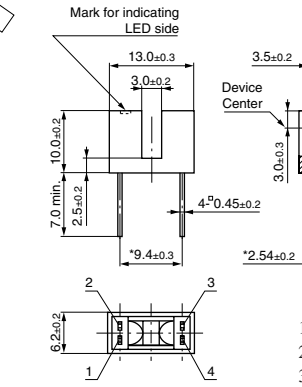
Note) ∗1: Input power derating ratio is 1.0 mW/°C at $T_a \geq 25°C$.
∗2: Output power derating ratio is 1.33 mW/°C at $T_a \geq 25°C$.

CNZ1102 Unit: mm



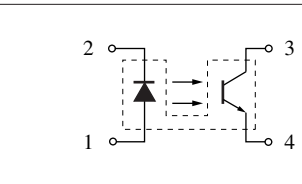
1: Anode
2: Cathode
3: Collector
4: Emitter
PISTR104-005 Package
(Note) ∗ is dimension at the root of leads

CNZ1108 Unit: mm



1: Anode
2: Cathode
3: Collector
4: Emitter
PISTR104-006 Package
(Note) ∗ is dimension at the root of leads

Internal Connection

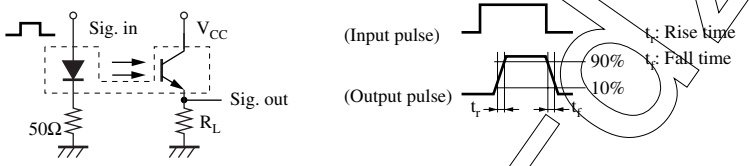


Note) The part numbers in the parenthesis show conventional part number.

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

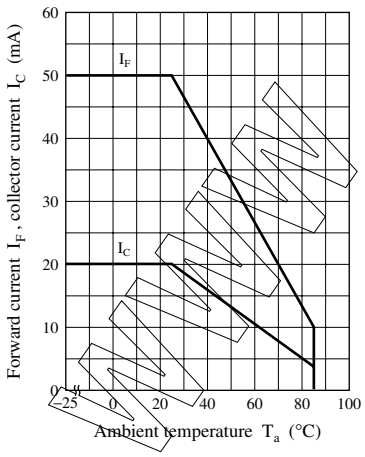
Note) 1. Input and output are practiced by electricity.
2. This device is designed be disregarded radiation.
3. *1: Switching time measurement circuit



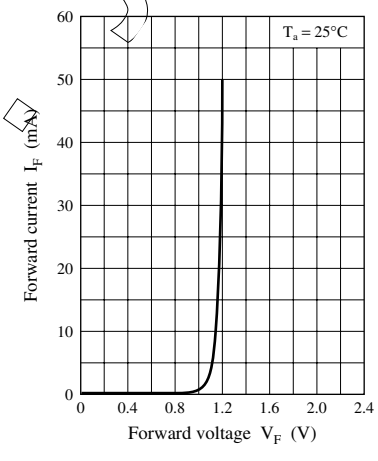
*2: Rank classification

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

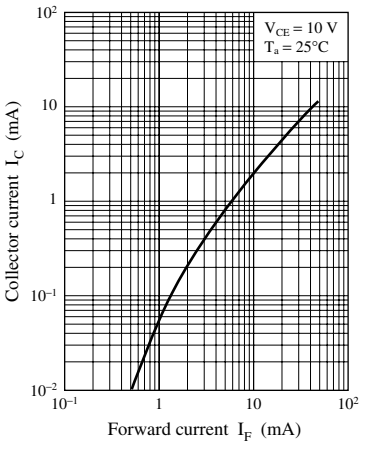
I_F , I_C — T_a



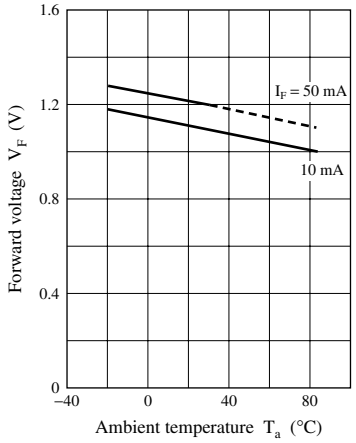
I_F — V_F



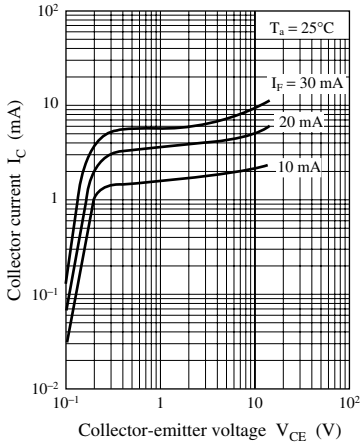
I_C — I_F



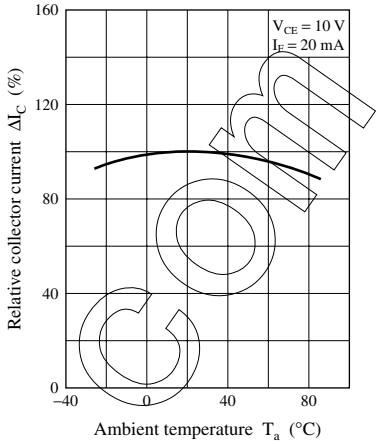
V_F — T_a



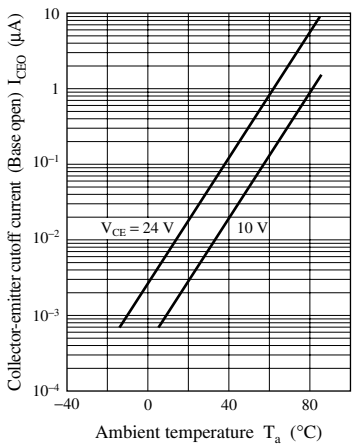
I_C — V_{CE}



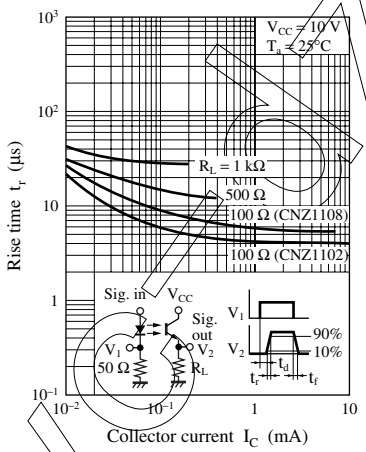
ΔI_C — T_a



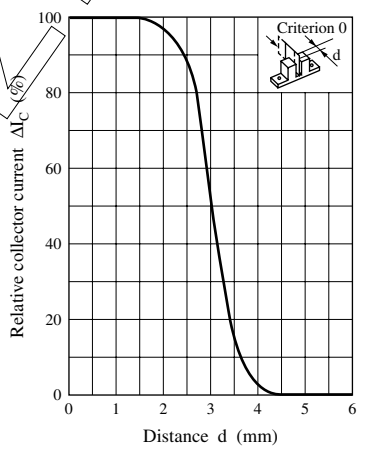
I_{CEO} — T_a



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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