

CNZ1110 (ON1110)

Photo Interrupter

For contactless SW, object detection

Overview

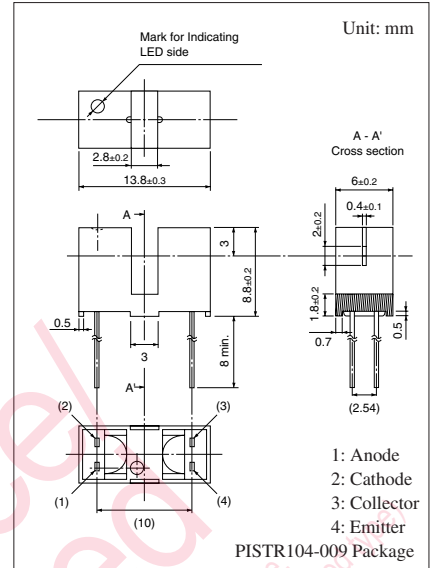
CNZ1110 is a photocoupler in which a high efficiency GaAs infrared light emitting diode is used as the light emitting element, and a high sensitivity phototransistor is used as the light detecting element. The two elements are arranged so as to face each other, and objects passing between them are detected.

Features

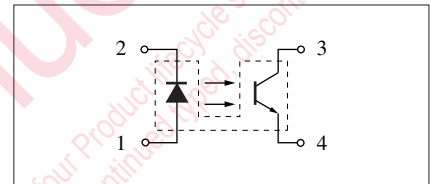
- Highly precise position detection: 0.3 mm
- Fast response t_r , $t_f = 6 \mu s$ (typ.)
- Small output current variation against change in temperature
- Small package used for saving mounting space

Absolute Maximum Ratings $T_a = 25^\circ C$

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 (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}
Storage temperature		T_{stg}	-30 to +100 °C



Internal Connection



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

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

Electrical-Optical Characteristics $T_a = 25^\circ C \pm 3^\circ C$

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	μA
	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 $V_{CE} = 10 \text{ V}, I_F = 20 \text{ mA}$	0.3			mA
	Collector-emitter saturation voltage	$V_{CE(sat)}$ $I_F = 50 \text{ mA}, I_C = 0.1 \text{ mA}$			0.3	V
	Rise time *1	t_r $V_{CC} = 10 \text{ V}, I_C = 1 \text{ mA}, R_L = 100 \Omega$		6		μs
Fall time *1	t_f			6	μs	

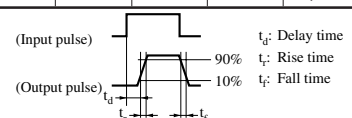
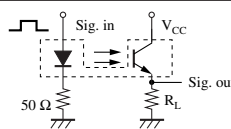
Note) 1. Input and output are practiced by electricity.

2. This device is designed be disregarded radiation.

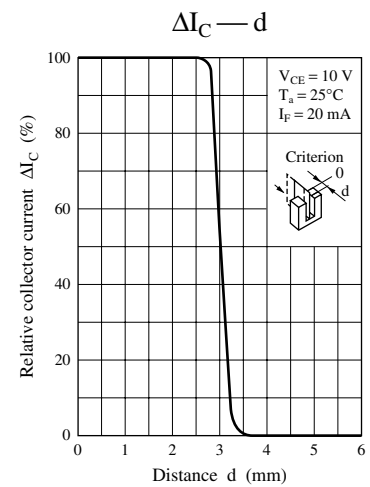
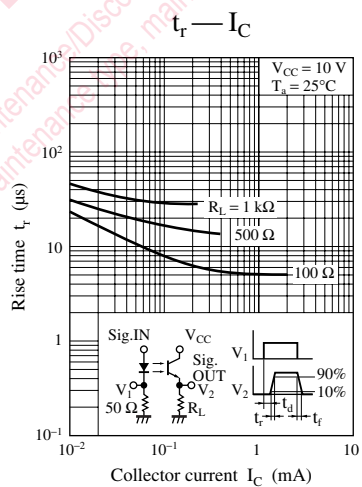
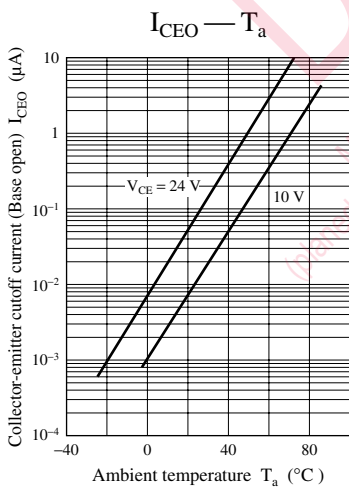
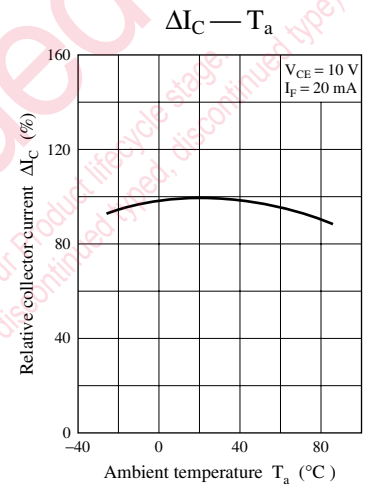
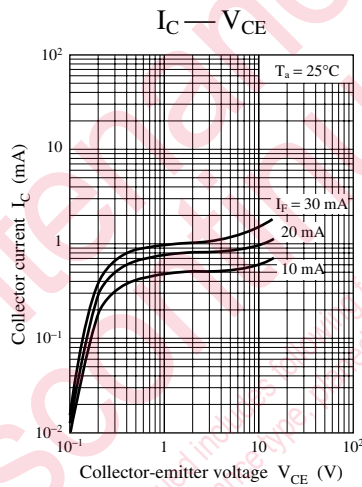
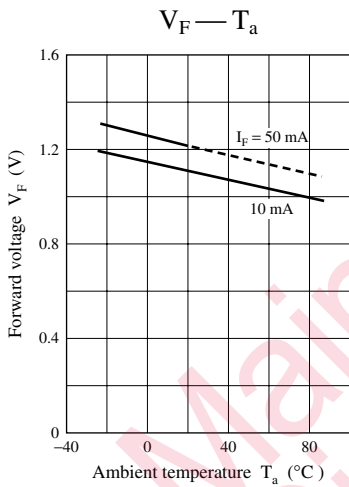
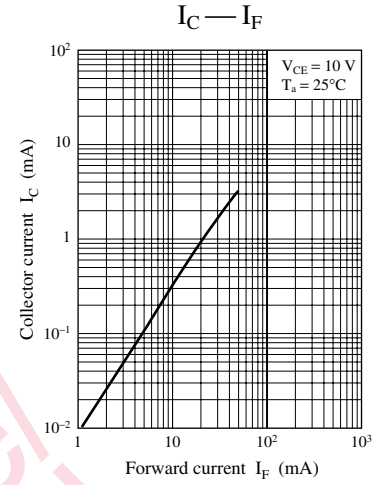
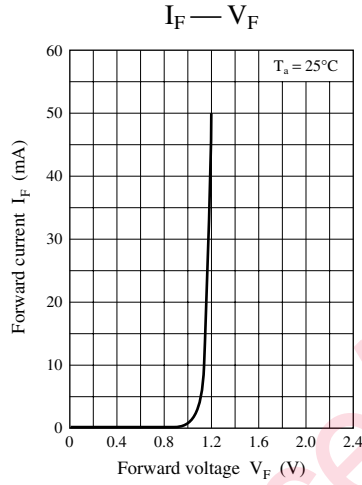
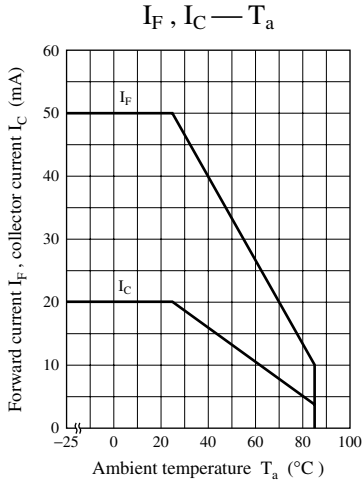
3. *1: Switching time measurement circuit

*2: Rank classification

Rank	Q	R	S
I_C (mA)	0.30 to 0.85	0.75 to 2.15	> 1.85



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



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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