

# CNZ1111 (ON1111), CNZ1112 (ON1112)

## Photo Interrupters

For contactless SW, object detection

### ■ Overview

CNZ1111 and CNZ1112 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

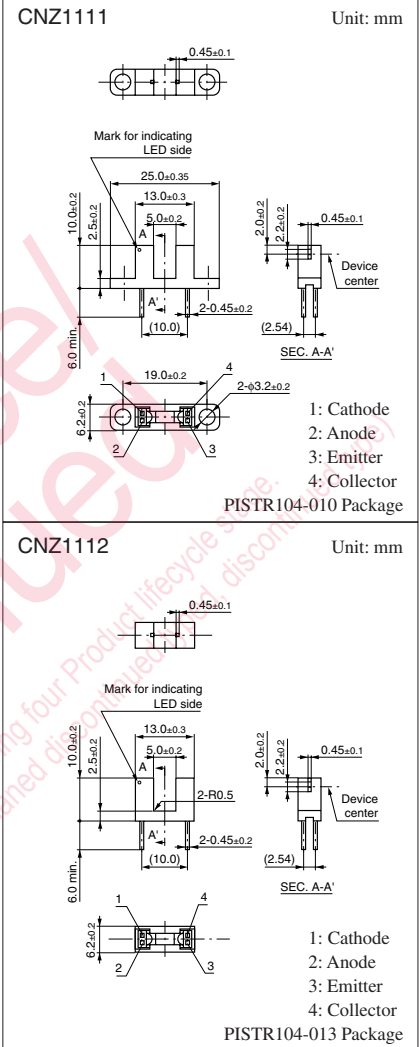
- Highly precise position detection : 0.3 mm
- Wide gap between emitting and detecting elements, suitable for thick plate detection
- Fast response :  $t_r$ ,  $t_f = 6 \mu s$  (typ.)
- Small output current variation against change in temperature

### ■ 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         | $T_{opr}$ | -25 to +85  | $^\circ C$ |
|                              | Storage temperature                   | $T_{stg}$ | -30 to +100 | $^\circ C$ |

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

\*2: Output power derating ratio is 1.34 mW/ $^\circ C$  at  $T_a \geq 25^\circ C$ .

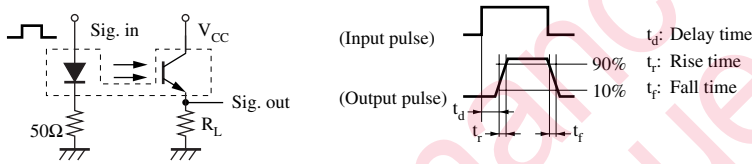


Note) The part numbers in the parenthesis show conventional part number.

■ 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            | $\mu\text{A}$ |
| 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                            | $I_C$         | $V_{CE} = 10 \text{ V}, I_F = 20 \text{ mA}$                  | 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 *                                  | $t_r$         | $V_{CC} = 10 \text{ V}, I_C = 1 \text{ mA}, R_L = 100 \Omega$ |     | 6.0 |               | $\mu\text{s}$ |
| Fall time *              | $t_f$  |               |   | 6.0 |     | $\mu\text{s}$ |               |

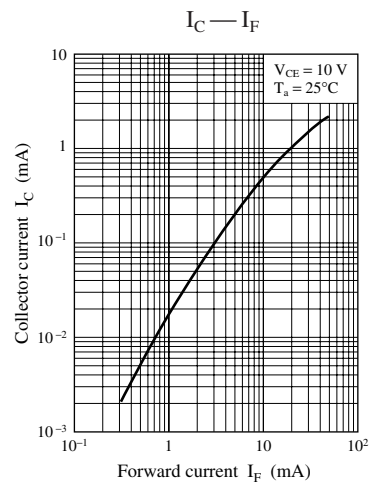
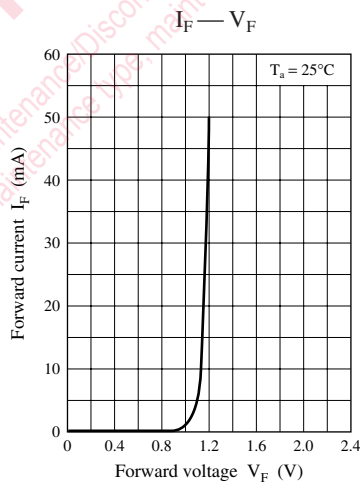
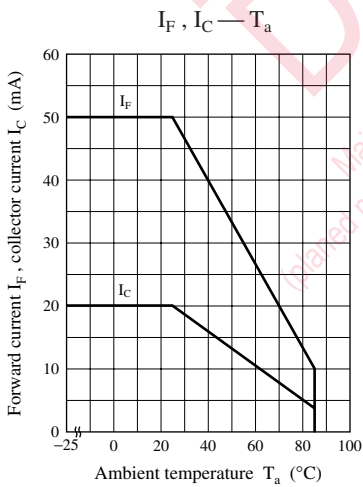
- Note) 1. Input and output are practiced by electricity.  
 2. This device is designed by disregarded radiation.  
 3. \*: Switching time measurement circuit

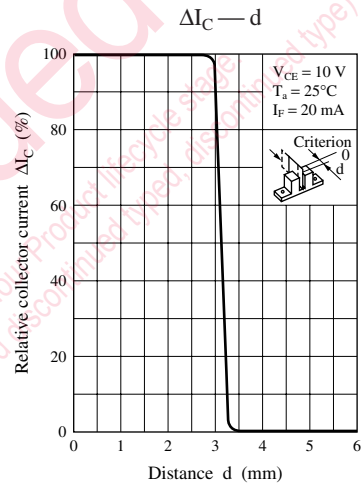
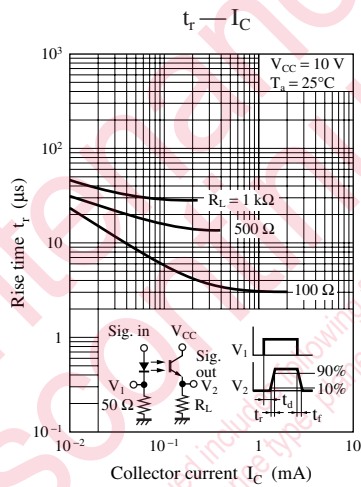
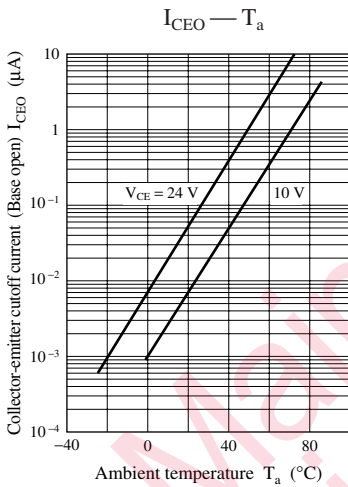
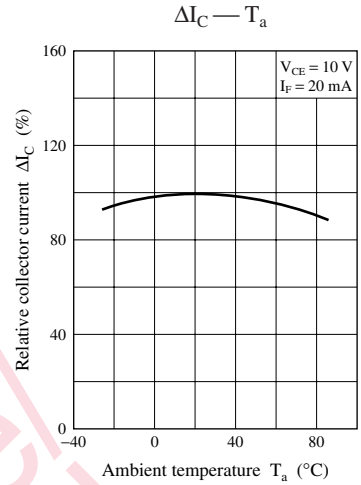
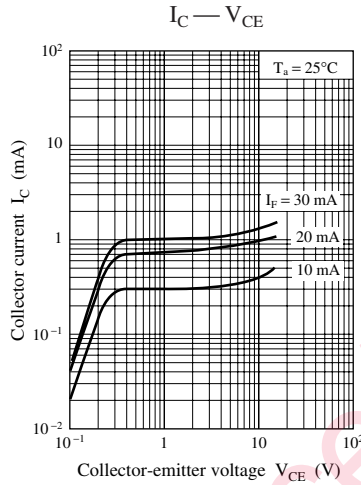
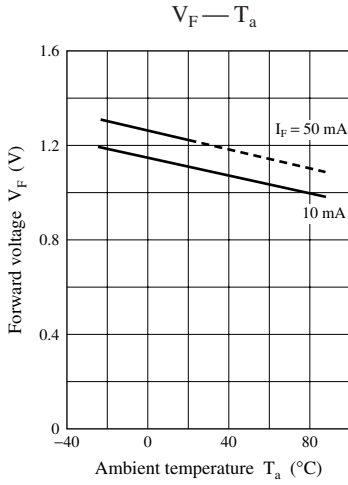


Maintenance discontinued

Discontinued

Maintenance discontinued includes following four Product lifecycle stage.  
 Planned maintenance type, planned discontinued type, planned discontinued type, discontinued type





# 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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