

CNZ1102, CNZ1108

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

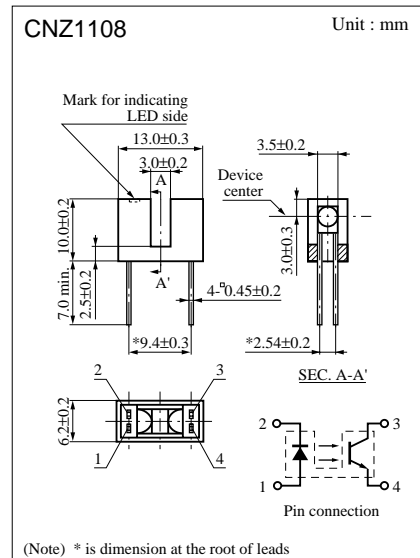
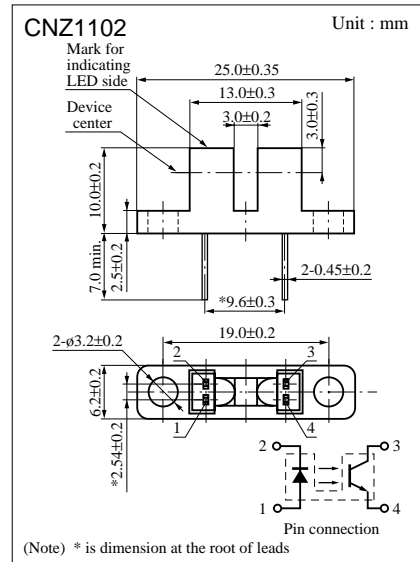
- Position detection accuracy : 1.2 mm
- Large output current
- Fast response : $t_r, t_f = 4 \mu\text{s}$ (typ.) (CNZ1102)
6 μs (typ.) (CNZ1108)
- Small output current variation against change in temperature
- Small package used for saving mounting space (CNZ1108)

Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

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

*1 Input power derating ratio is 1.0 mW/ $^\circ\text{C}$ at $T_a \geq 25^\circ\text{C}$.

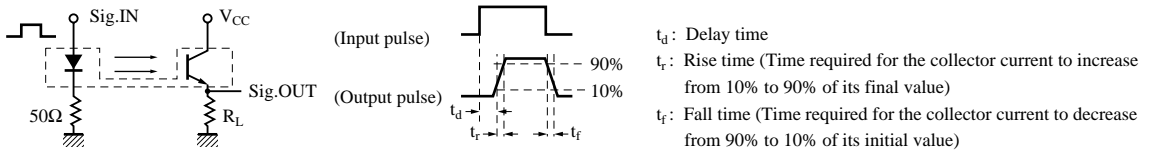
*2 Output power derating ratio is 1.33 mW/ $^\circ\text{C}$ at $T_a \geq 25^\circ\text{C}$.



■ Electrical Characteristics (Ta = 25°C)

| Parameter | | Symbol | Conditions | min | typ | max | Unit |
|--------------------------|----------------------------------|---------------|--|--|-----|-----|---------------|
| Input characteristics | Forward voltage (DC) | V_F | $I_F = 50\text{mA}$ | | 1.2 | 1.5 | V |
| | Reverse current (DC) | I_R | $V_R = 3\text{V}$ | | | 10 | μA |
| | Capacitance between terminals | C_t | $V_R = 0\text{V}, f = 1\text{MHz}$ | | 50 | | pF |
| Output characteristics | Collector cutoff current | I_{CEO} | $V_{CE} = 10\text{V}$ | | | 200 | nA |
| | Collector to emitter capacitance | C_C | $V_{CE} = 10\text{V}, f = 1\text{MHz}$ | | 5 | | pF |
| Transfer characteristics | Collector current | I_C^{*2} | $V_{CE} = 10\text{V}, I_F = 20\text{mA}$ | 2 | | | mA |
| | Response time | CNZ1102 | $V_{CC} = 10\text{V}, I_C = 5\text{mA}, R_L = 100\Omega$ | | 4 | | μs |
| | | CNZ1108 | | $V_{CC} = 10\text{V}, I_C = 1\text{mA}, R_L = 100\Omega$ | | 6 | μs |
| | Collector to emitter | CNZ1102 | $V_{CE(sat)}$ | $I_F = 50\text{mA}, I_C = 1\text{mA}$ | | 0.4 | V |
| Saturation voltage | CNZ1108 | $V_{CE(sat)}$ | $I_F = 50\text{mA}, I_C = 0.1\text{mA}$ | | 0.4 | V | |

*1 Switching time measurement circuit



*2 I_C classifications

| Class | Q | R | S |
|------------|------------|-------------|-------------|
| I_C (mA) | 2.0 to 5.0 | 4.0 to 10.0 | 7.0 to 20.0 |

