

CNZ1111, CNZ1112

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

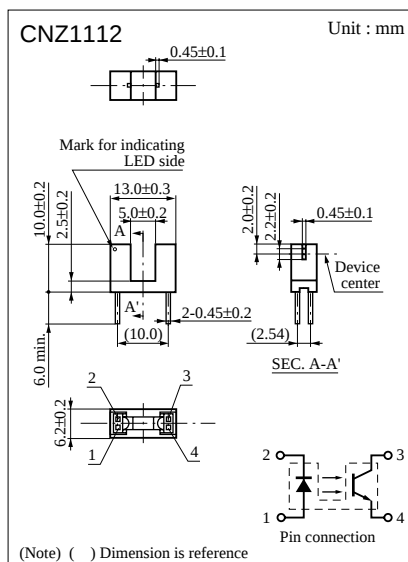
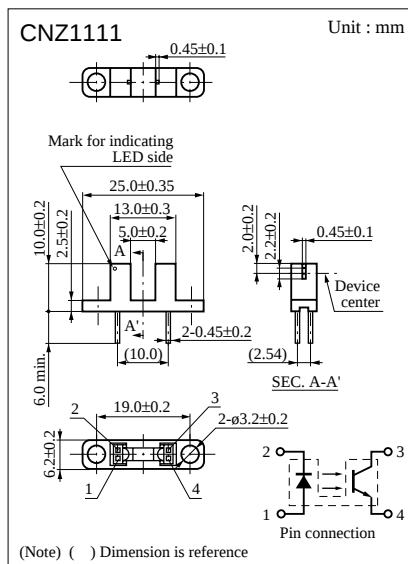
- Highly precise position detection : 0.3 mm
- Wide gap between emitting and detecting elements, suitable for thick plate detection
- Fast response : $t_r, t_f = 6 \mu s$ (typ.)
- Small output current variation against change in temperature

Absolute Maximum Ratings (Ta = 25°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
Temperature	Collector power dissipation	P_C^{*2}	100	mW
	Operating ambient temperature	T_{opr}	-25 to +85	°C
	Storage temperature	T_{stg}	-30 to +100	°C

*1 Input power derating ratio is 1.0 mW/°C at Ta ≥ 25°C.

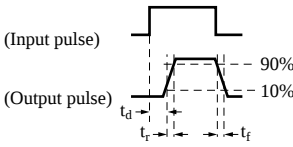
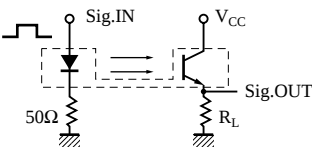
*2 Output power derating ratio is 1.33 mW/°C at Ta ≥ 25°C.



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

* Switching time measurement circuit



t_d : Delay time
 t_r : Rise time (Time required for the collector current to increase from 10% to 90% of its final value)
 t_f : Fall time (Time required for the collector current to decrease from 90% to 10% of its initial value)

