

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

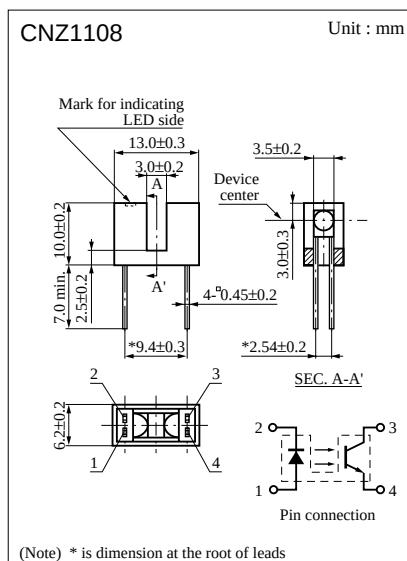
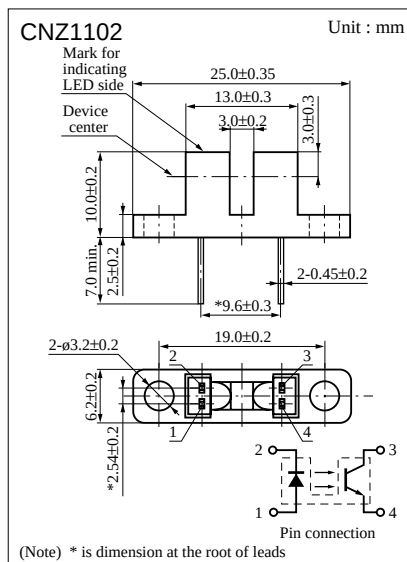
- Position detection accuracy : 1.2 mm
- Large output current
- Fast response : $t_r, t_f = 4 \mu s$ (typ.) (CNZ1102)
6 μs (typ.) (CNZ1108)
- Small output current variation against change in temperature
- Small package used for saving mounting space (CNZ1108)

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

	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	$^\circ C$
	Storage temperature	T_{stg}	-30 to +100	$^\circ C$

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

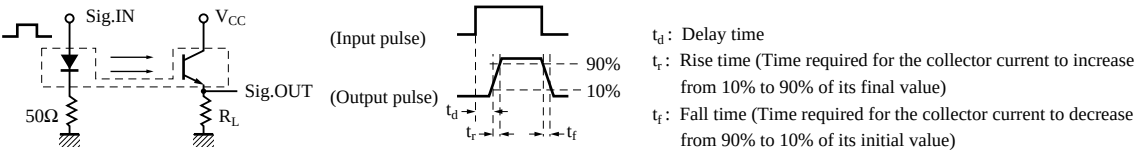
*2 Output power derating ratio is 1.33 mW/ $^\circ C$ at $T_a \geq 25^\circ C$.



■ 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	$V_{CE(\text{sat})}$, $I_F = 50\text{mA}$, $I_C = 1\text{mA}$			0.4	V
	Saturation voltage	CNZ1108	$V_{CE(\text{sat})}$, $I_F = 50\text{mA}$, $I_C = 0.1\text{mA}$			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

