

# CNZ1102, CNZ1108 (ON1102, ON1108)

## 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

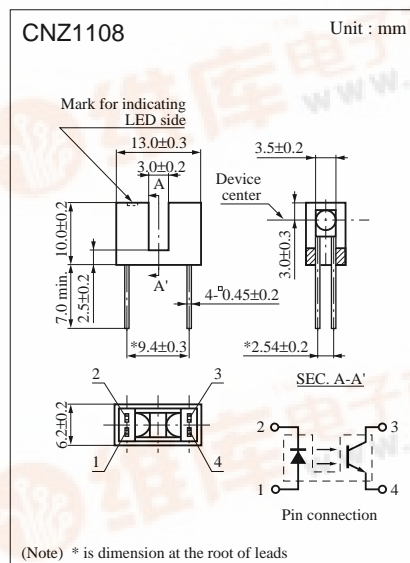
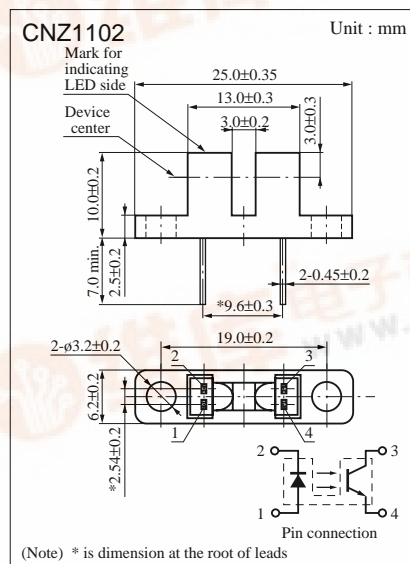
- Position detection accuracy : 1.2 mm
- Large output current
- Fast response :  $t_r, t_f = 4 \mu s$  (typ.) (CNZ1102)  
6  $\mu s$  (typ.) (CNZ1108)
- Small output current variation against change in temperature
- Small package used for saving mounting space (CNZ1108)

### 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
Temperature	Collector power dissipation	$P_C^{*2}$	100	mW
	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  $T_a \geq 25^\circ C$ .

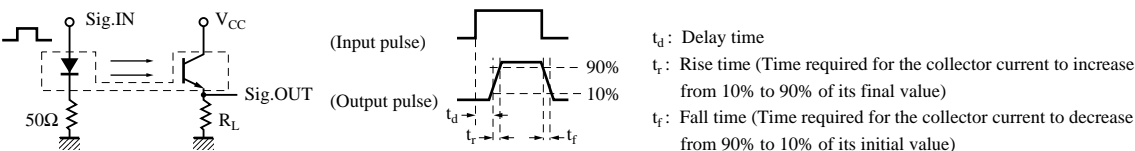
\*2 Output power derating ratio is 1.33 mW/ $^\circ C$  at  $T_a \geq 25^\circ C$ .



■ Electrical Characteristics (Ta = 25°C)

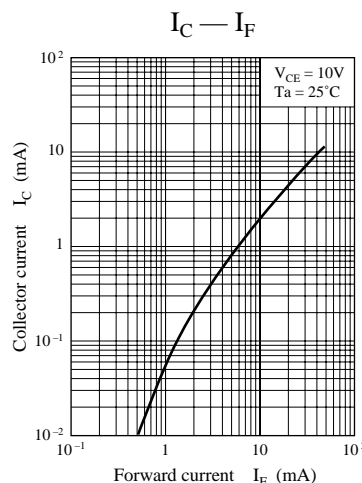
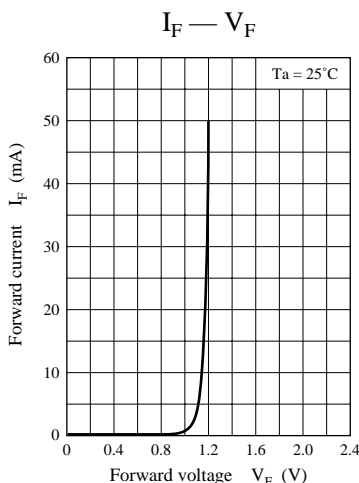
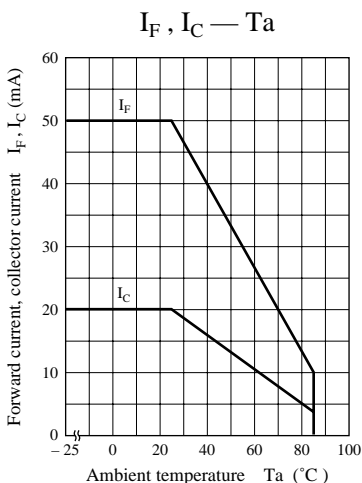
Parameter		Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	$V_F$	$I_F = 50\text{mA}$		1.2	1.5	V
	Reverse current (DC)	$I_R$	$V_R = 3\text{V}$			10	$\mu\text{A}$
	Capacitance between terminals	$C_t$	$V_R = 0\text{V}, f = 1\text{MHz}$		50		pF
Output characteristics	Collector 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	$t_r, t_f^{*1}$	$V_{CC} = 10\text{V}, I_C = 5\text{mA}, R_L = 100\Omega$	4		$\mu\text{s}$
		CNZ1108		$V_{CC} = 10\text{V}, I_C = 1\text{mA}, R_L = 100\Omega$	6		$\mu\text{s}$
	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

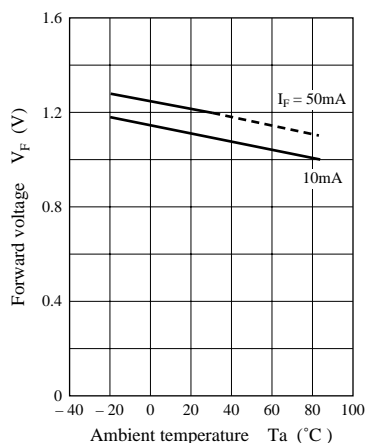
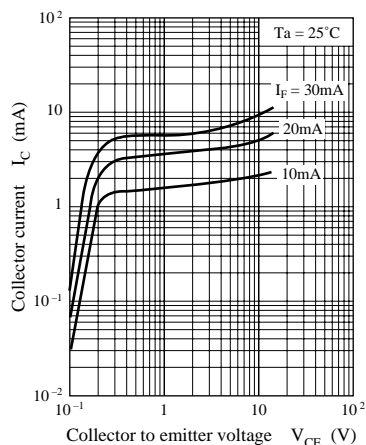
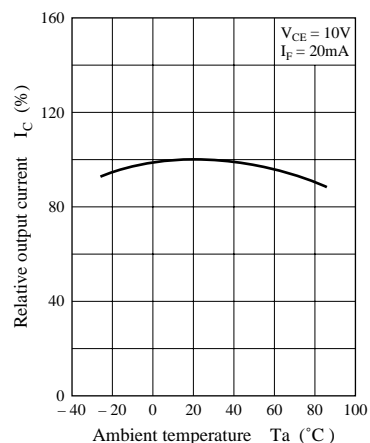
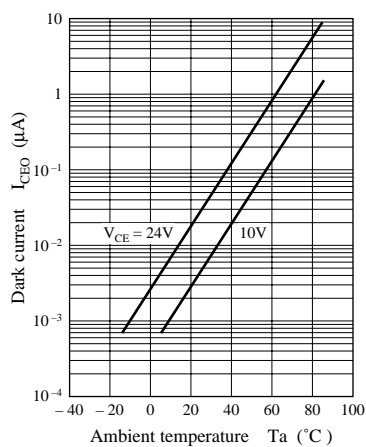
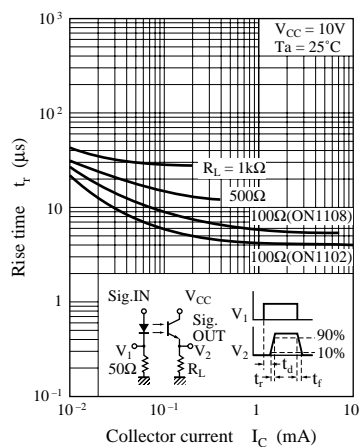
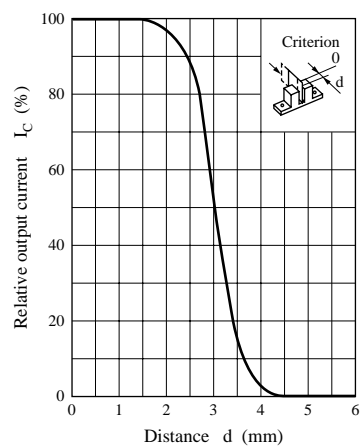
\*1 Switching time measurement circuit



\*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



$V_F - T_a$  $I_C - V_{CE}$  $I_C - T_a$  $I_{CEO} - T_a$  $t_r - I_C$  $I_C - d$ 

# Caution for Safety

 **DANGER**

Gallium arsenide material (GaAs) is used in this product.

Therefore, do not burn, destroy, cut, crush, or chemically decompose the product, since gallium arsenide material in powder or vapor form is harmful to human health.

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