

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

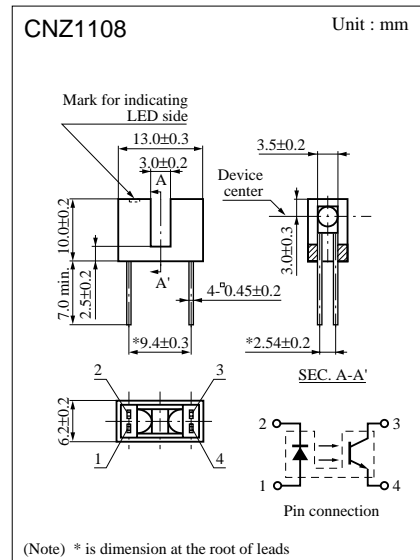
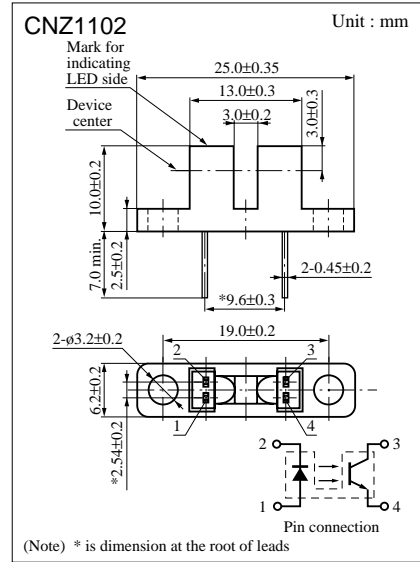
- Position detection accuracy : 1.2 mm
- Large output current
- Fast response : $t_r, t_f = 4 \mu s$ (typ.) (CNZ1102)
6 μs (typ.) (CNZ1108)
- Small output current variation against change in temperature
- Small package used for saving mounting space (CNZ1108)

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
	Collector power dissipation	P_C^{*2}	100	mW
Temperature	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.

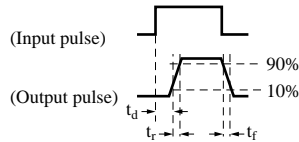
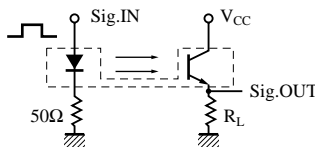


Note) The part numbers in the parenthesis show conventional part number.

■ 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	
	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



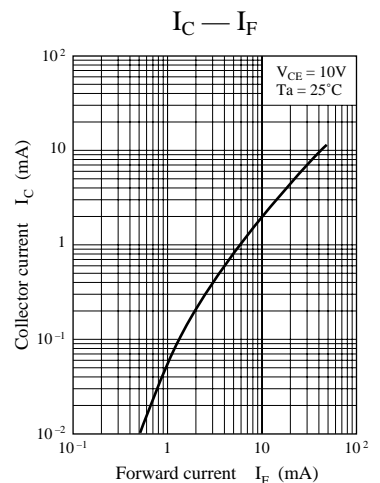
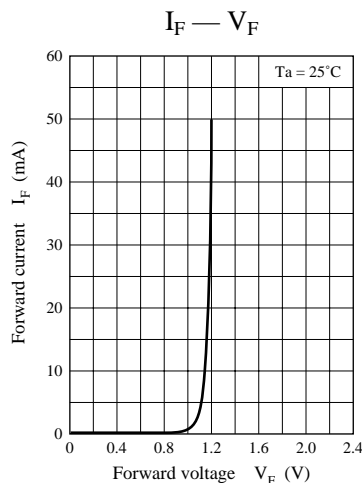
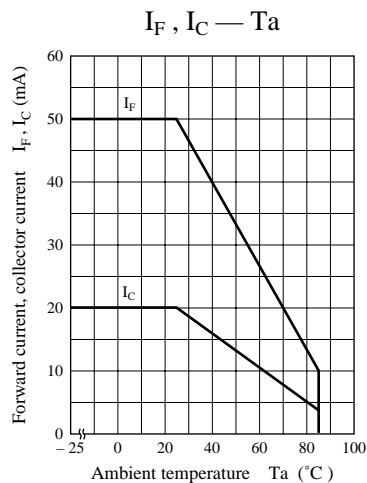
t_d : Delay time

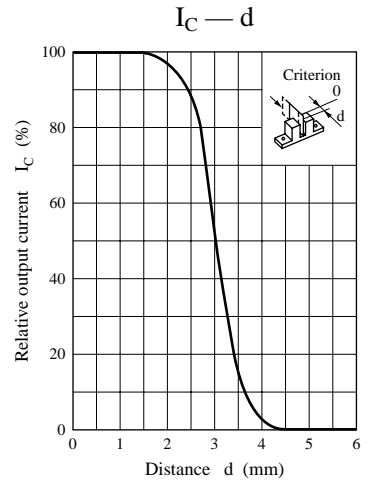
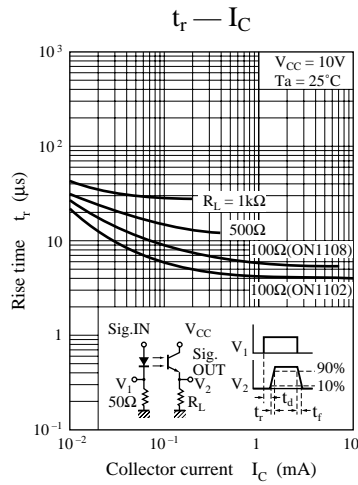
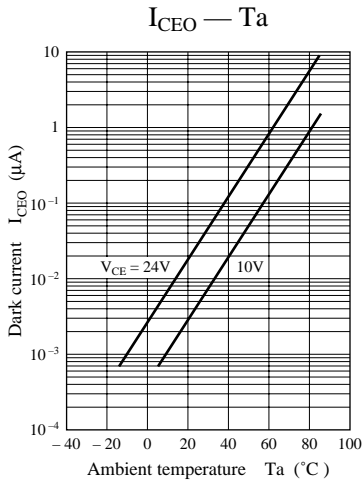
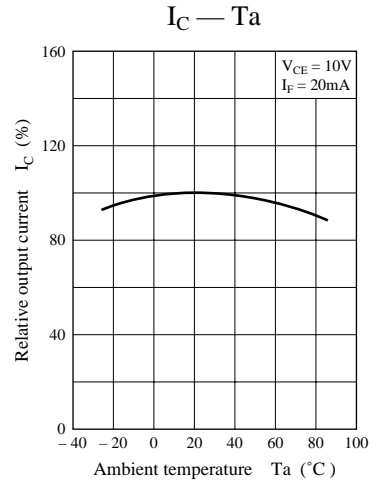
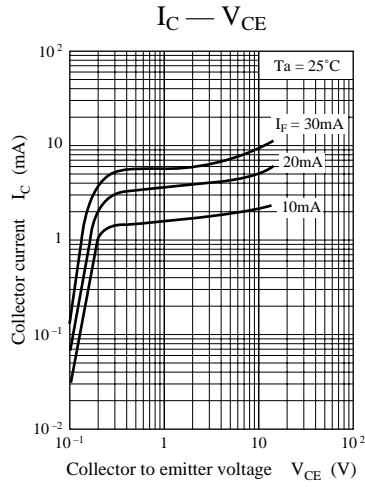
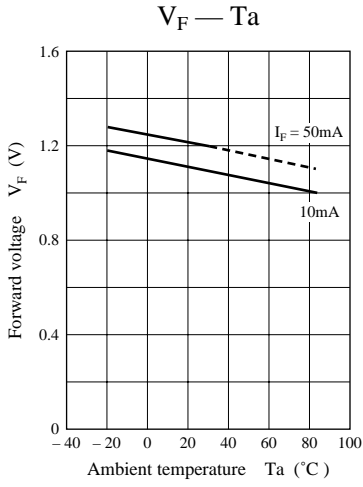
t_r : Rise time (Time required for the collector current to increase from 10% to 90% of its final value)

t_f : Fall time (Time required for the collector current to decrease from 90% to 10% of its initial value)

*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





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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