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

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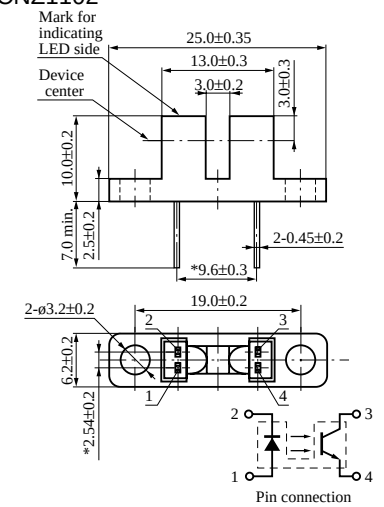
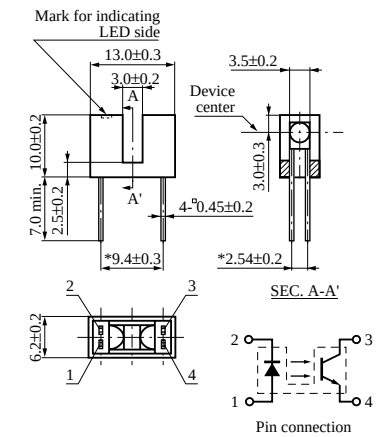
- Position detection accuracy : 1.2 mm
- Large output current
- Fast response : t_r, t_f = 4 µs (typ.) (CNZ1102)
  6 µs (typ.) (CNZ1108)
- Small output current variation against change in temperature
- Small package used for saving mounting space (CNZ1108)

CNZ1102 Unit : mm



(Note) * is dimension at the root of leads

CNZ1108 Unit : mm



(Note) * is dimension at the root of leads

■ 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.

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■ Electrical Characteristics (Ta = 25˚C)

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

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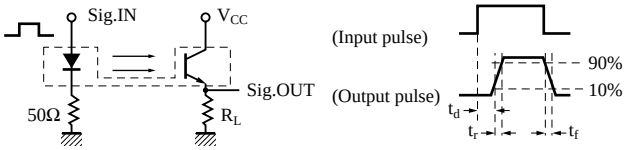
*1 Switching time measurement circuit

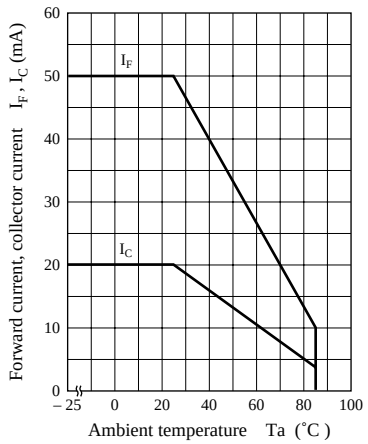


t_d : Delay time
t_r : Rise time (Time required for the collector current to increase from 10% to 90% of its final value)
t_f : Fall time (Time required for the collector current to decrease from 90% to 10% of its initial value)

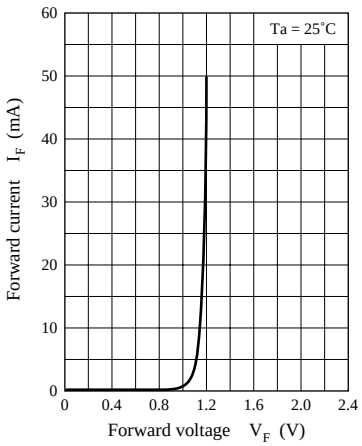
*2 I_C classifications

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

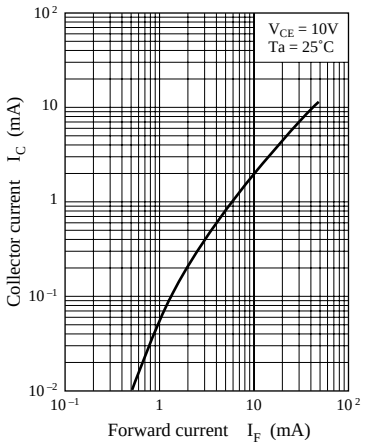
I_F , I_C — Ta



I_F — V_F



I_C — I_F



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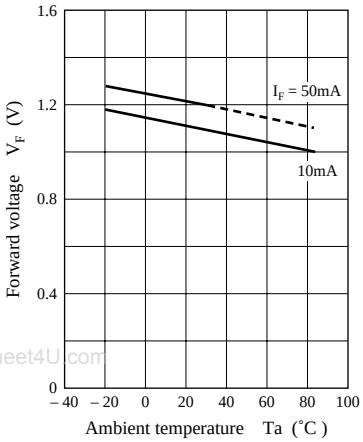
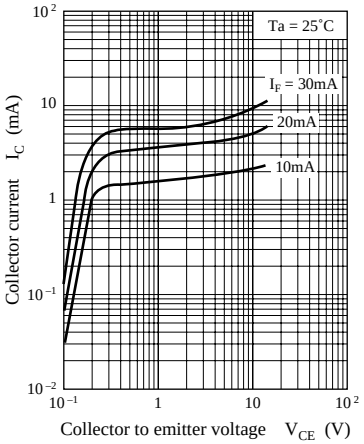
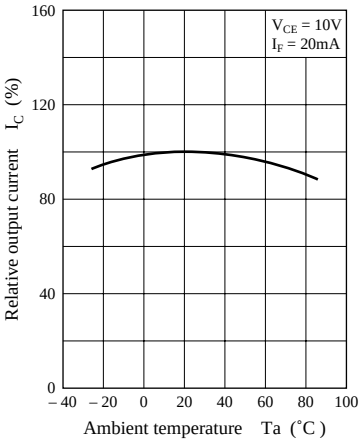
V_F — Ta



I_C — V_{CE}



I_C — Ta



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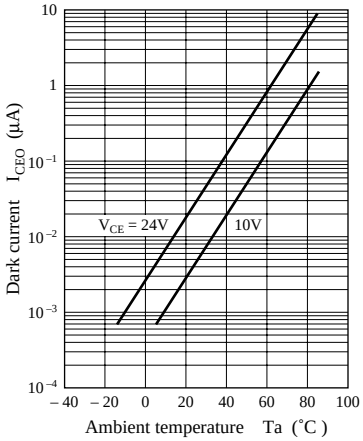
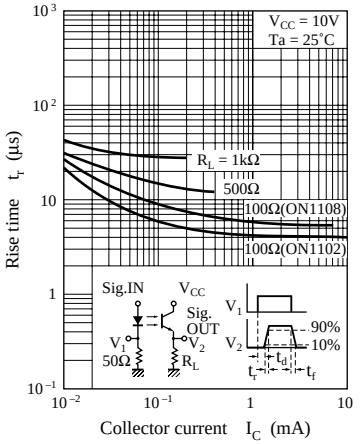
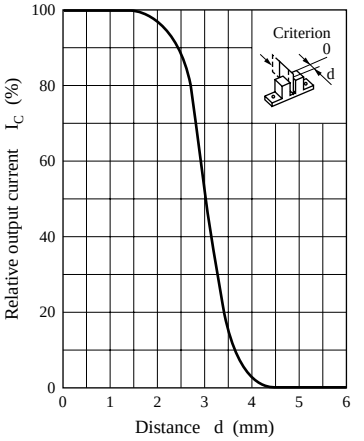
I_{CEO} — Ta



t_r — I_C



I_C — d



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⚠ Caution for Safety

⚠ DANGER

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

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