

CNA1014H (ON1387)

Photo Interrupters

■ Outline

CNA1014H is a transmissive photosensor series 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: 0.3 mm
- With attachment positioning boss
- Fast response: t_r , t_f = 5 μ s (typ.)

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter		Symbol	Rating	Unit
Input (Light emitting diode)	Reverse voltage (DC)	V _R	3	V
	Forward current (DC)	I _F	50	mA
	Power dissipation *1	P _D	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 *2	P _C	100	mW
Temperature	Operating ambient temperature	T _{opr}	−25 to +85	°C
	Storage temperature	T _{stg}	−40 to +100	°C

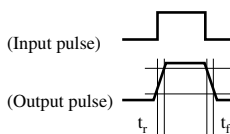
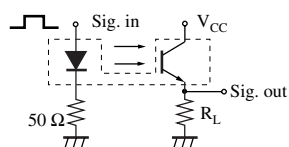
Note) *1: Input power derating ratio is 1.0 mW/ $^\circ\text{C}$ at $T_a = 25^\circ\text{C}$.

*2: Output power derating ratio is 1.33 mW/ $^\circ\text{C}$ at $T_a = 25^\circ\text{C}$.

■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Forward voltage (DC)	V_F $I_F = 20\text{mA}$		1.25	1.4	V
	Reverse current (DC)	I_R $V_R = 3\text{V}$			10	μA
Output characteristics	Collector cutoff current	I_{CEO} $V_{CE} = 10\text{V}$		10	200	nA
Transfer characteristics	Collector current	I_C $V_{CE} = 5\text{V}$, $I_F = 20\text{mA}$, $R_L = 100\ \Omega$	1.5		15	mA
	Collector to emitter saturation voltage	$V_{CE(sat)}$ $I_F = 40\text{mA}$, $I_C = 1\text{mA}$			0.4	V
	Response time *	t_r , t_f $V_{CC} = 5\text{V}$, $I_C = 1\text{mA}$, $R_L = 100\ \Omega$		5		μs

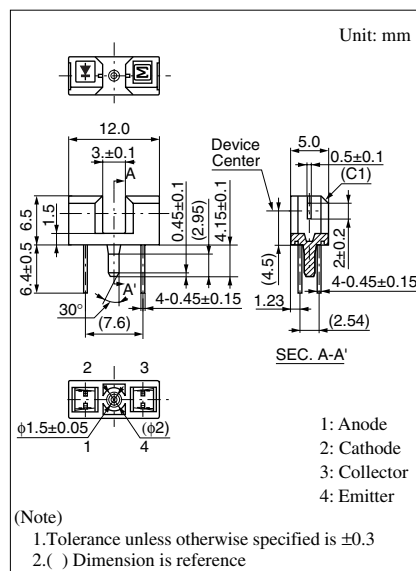
Note) *: Switching time measurement circuit



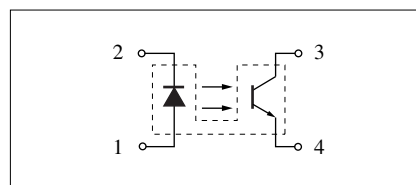
t_r : Rise time (Time required for the collector current to increase from 10% to 90% of its final value)

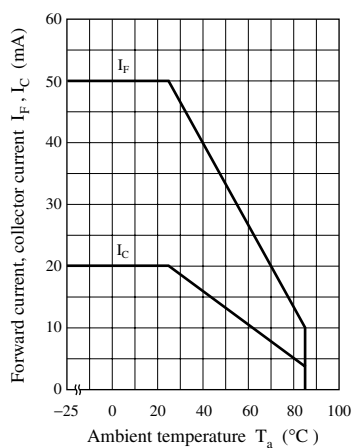
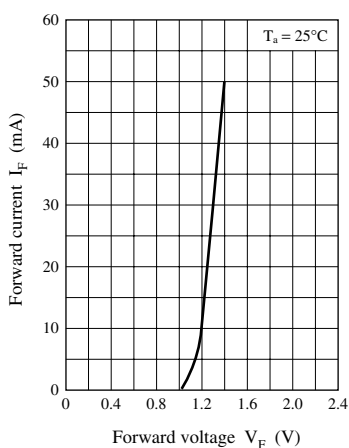
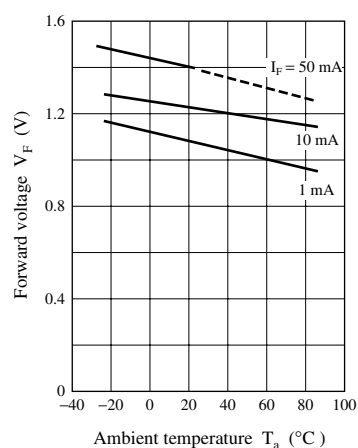
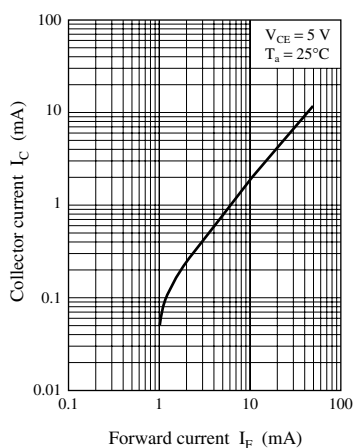
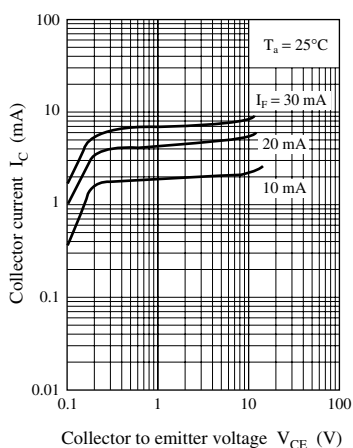
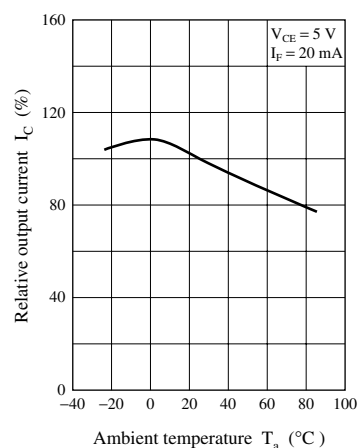
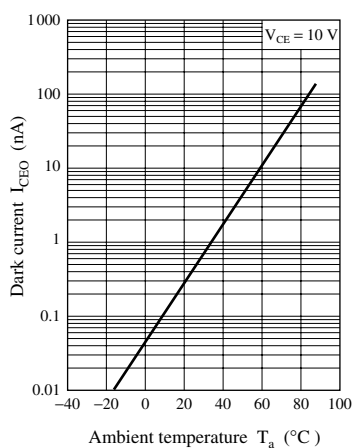
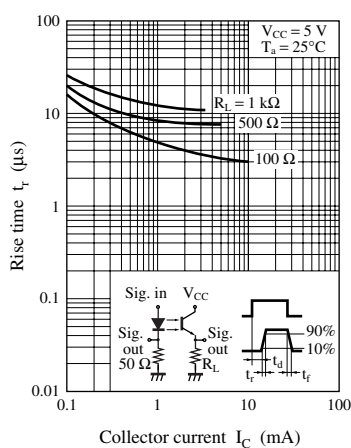
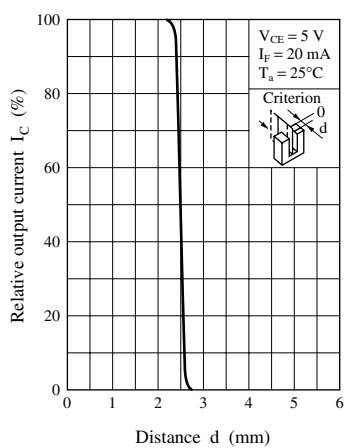
t_f : Fall time (Time required for the collector current to decrease from 90% to 10% of its initial value)

Note) The part number in the parenthesis shows conventional part number.



Internal connection



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

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.

Observe the relevant laws and regulations when disposing of the products. Do not mix them with ordinary industrial waste or household refuse when disposing of GaAs-containing products.

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