

# CNA1011K (ON1113)

## Photo Interrupter

For contactless SW, object detection

### Overview

CNA1011K is a small size photocoupler package consisting of a high efficiency GaAs infrared light emitting diode used as the light emitting element, and a high sensitivity phototransistor used as the light detecting element.

### Features

- Highly precise position detection : 0.3 mm
- Wide gap between emitting and detecting elements, suitable for thick plate detection
- Fast response :  $t_r, t_f = 6 \mu s$  (typ.)
- Small output current variation against change in temperature

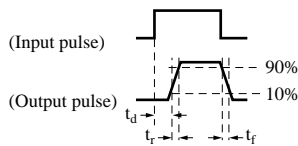
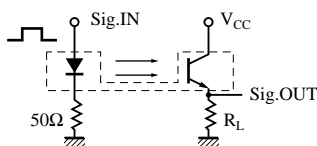
### Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Rated	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 °C
	Storage temperature	$T_{stg}$	-30 to +100 °C

### Electrical Characteristics (Ta = 25°C)

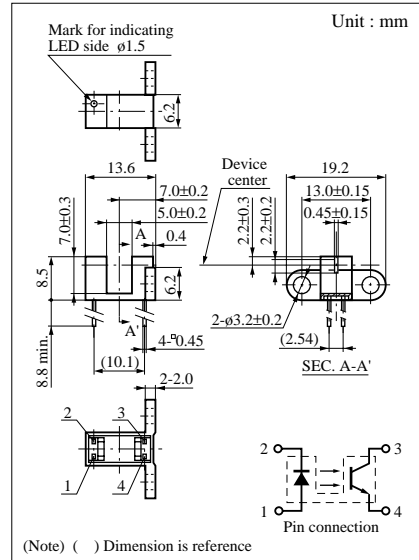
Parameter	Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	$V_F$ $I_F = 50mA$		1.2	1.5	V
	Reverse current (DC)	$I_R$ $V_R = 3V$			10	$\mu A$
	Capacitance between terminals	$C_t$ $V_R = 0V, f = 1MHz$		50		pF
Output characteristics	Collector cutoff current	$I_{CEO}$ $V_{CE} = 10V$			200	nA
	Collector to emitter capacitance	$C_C$ $V_{CE} = 10V, f = 1MHz$		5		pF
Transfer characteristics	Collector current	$I_C$ $V_{CE} = 10V, I_F = 20mA, R_L = 100\Omega$	0.3			mA
	Response time	$t_r, t_f^{*}$ $V_{CC} = 10V, I_C = 1mA, R_L = 100\Omega$		6		$\mu s$
	Collector to emitter saturation voltage	$V_{CE(sat)}$ $I_F = 50mA, I_C = 0.1mA$			0.5	V

\* Switching time measurement circuit



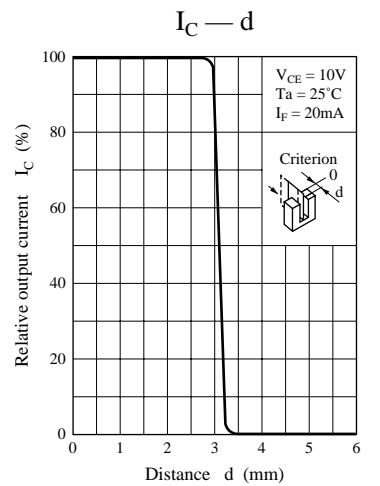
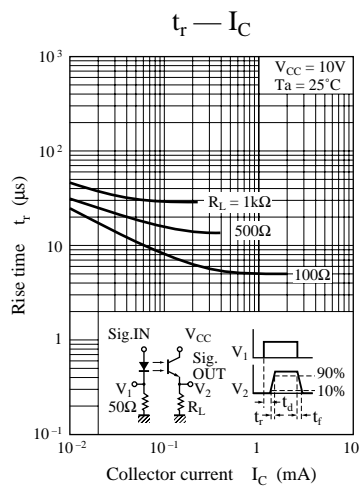
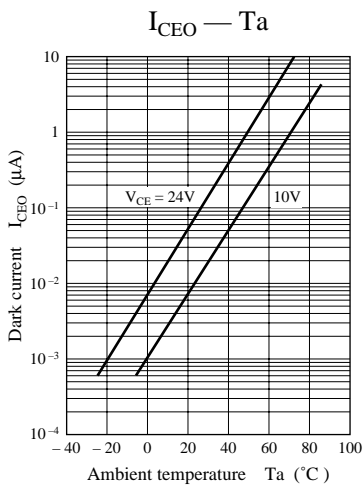
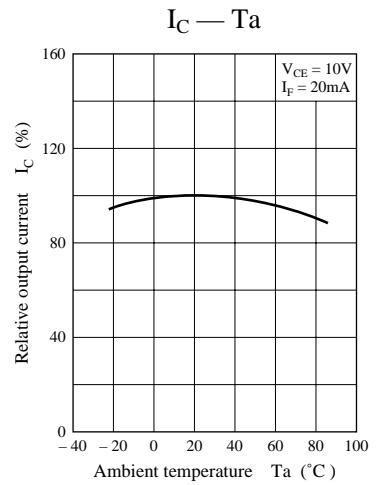
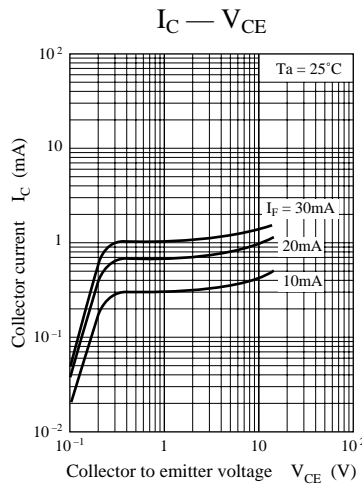
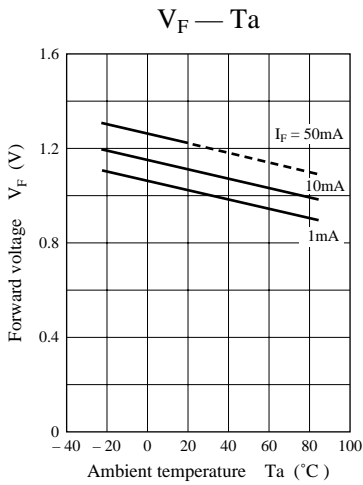
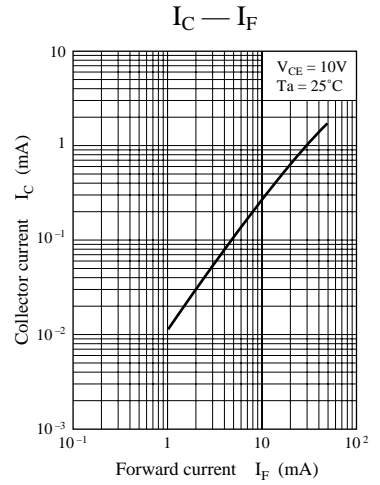
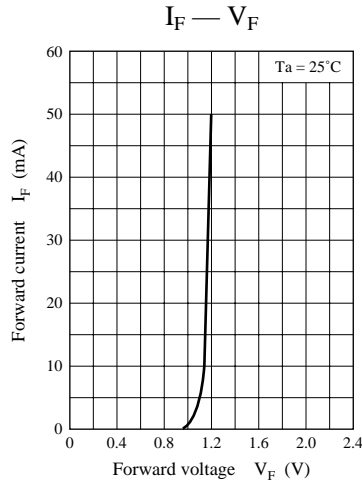
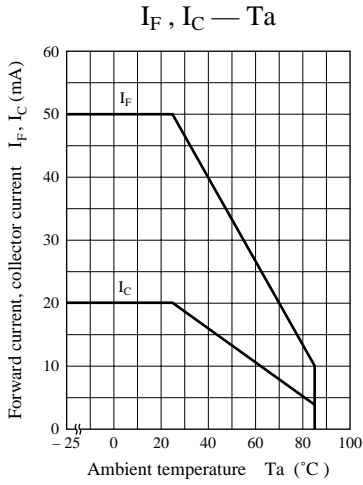
$t_d$ : Delay time  
 $t_r$ : Rise time (Time required for the collector current to increase from 10% to 90% of its final value)  
 $t_f$ : Fall time (Time required for the collector current to decrease from 90% to 10% of its initial value)

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



\*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.



# 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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