CNA1012K (ON1114)

Photo Interrupter

For contactless SW and object detection

■ Overview

CNA1012K is 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

- 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 µs (typ.)
- Small output current variation against change in temperature
- Large output current

■ Absolute Maximum Ratings T_a = 25ΣΔγρC

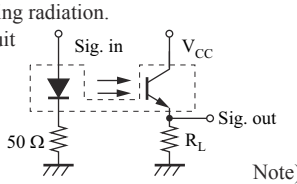
Parameter		Symbol	Rating	Unit
Input (Light emitting diode)	Power dissipation *1	P_D	75	mW
	Forward current	I_F	50	mA
	Reverse voltage	V_R	3	V
Output (Photo transistor)	Collector-emitter voltage (Base open)	V_{CEO}	30	V
	Emitter-collector voltage (Base open)	V_{ECO}	5	V
	Collector current	I_C	20	mA
	Collector power dissipation *2	P_C	100	mW
Operating ambient temperature		T_{opr}	–25 to +85	°C
Storage temperature		T_{stg}	–30 to +100	°C

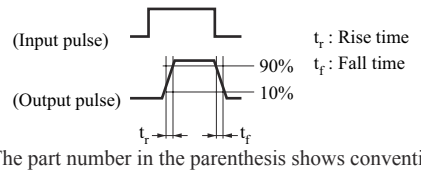
Note) *1: Input power derating ratio is 1.0 mW/°C at $T_a \geq 25$°C.
*2: Output power derating ratio is 1.34 mW/°C at $T_a \geq 25$°C.

■ Electrical-Optical Characteristics T_a = 25ΣΔγρC±3ΣΔγρC

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Reverse current	I_R	V_R = 3 V			10	µA
	Forward voltage	V_F	I_F = 50 mA		1.2	1.5	V
Output characteristics	Collector-emitter cutoff current (Base open)	I_{CEO}	V_{CE} = 10 V			200	nA
	Collector-emitter capacitance	C_C	V_{CE} = 10 V, f = 1 MHz		5		pF
Transfer characteristics	Collector current	I_C	V_{CE} = 10 V, I_F = 20 mA	0.7			mA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	I_F = 50 mA, I_C = 0.1 mA			0.3	V
	Rise time *	t_r	V_{CC} = 10 V, I_C = 1 mA, R_L = 100 Ω		6.0		µs
	Fall time *	t_f			6.0		µs

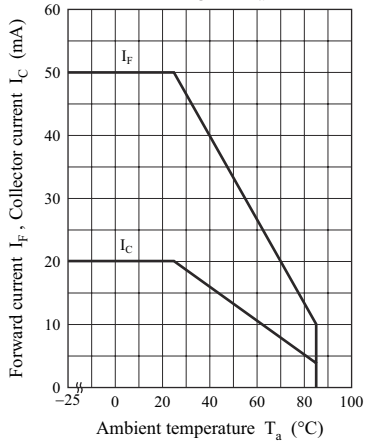
Note) 1. Input and output are practiced by electricity.
2. This device is designed by disregarding radiation.
3. *: Switching time measurement circuit



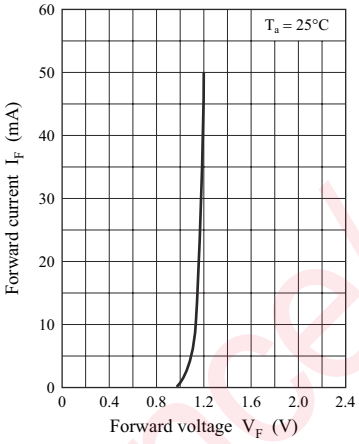


Note) The part number in the parenthesis shows conventional part number.

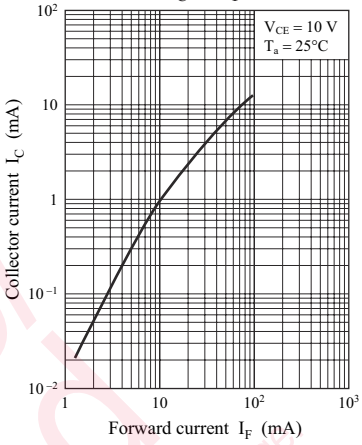
I_F , I_C — T_a



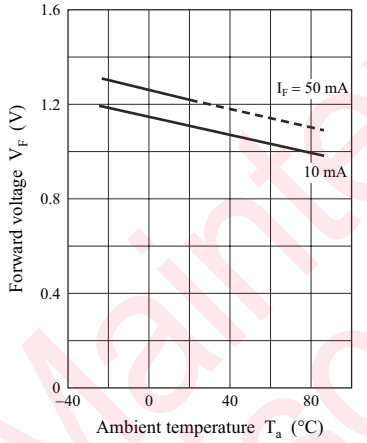
I_F — V_F



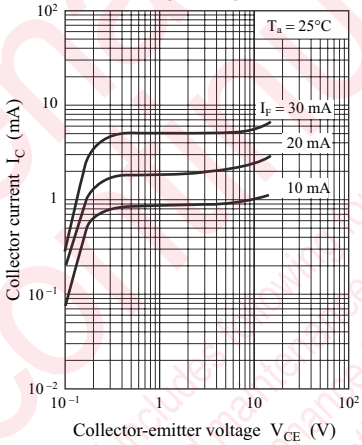
I_C — I_F



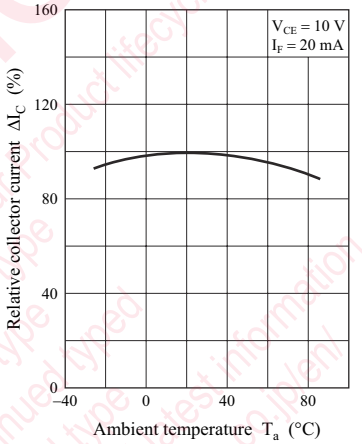
V_F — T_a



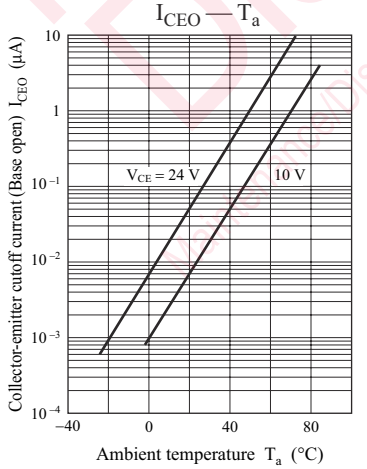
I_C — V_{CE}



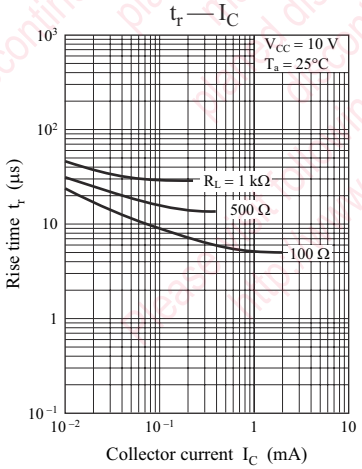
ΔI_C — T_a



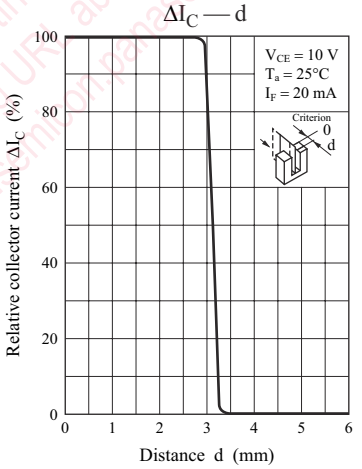
I_{CEO} — T_a



t_r — I_C

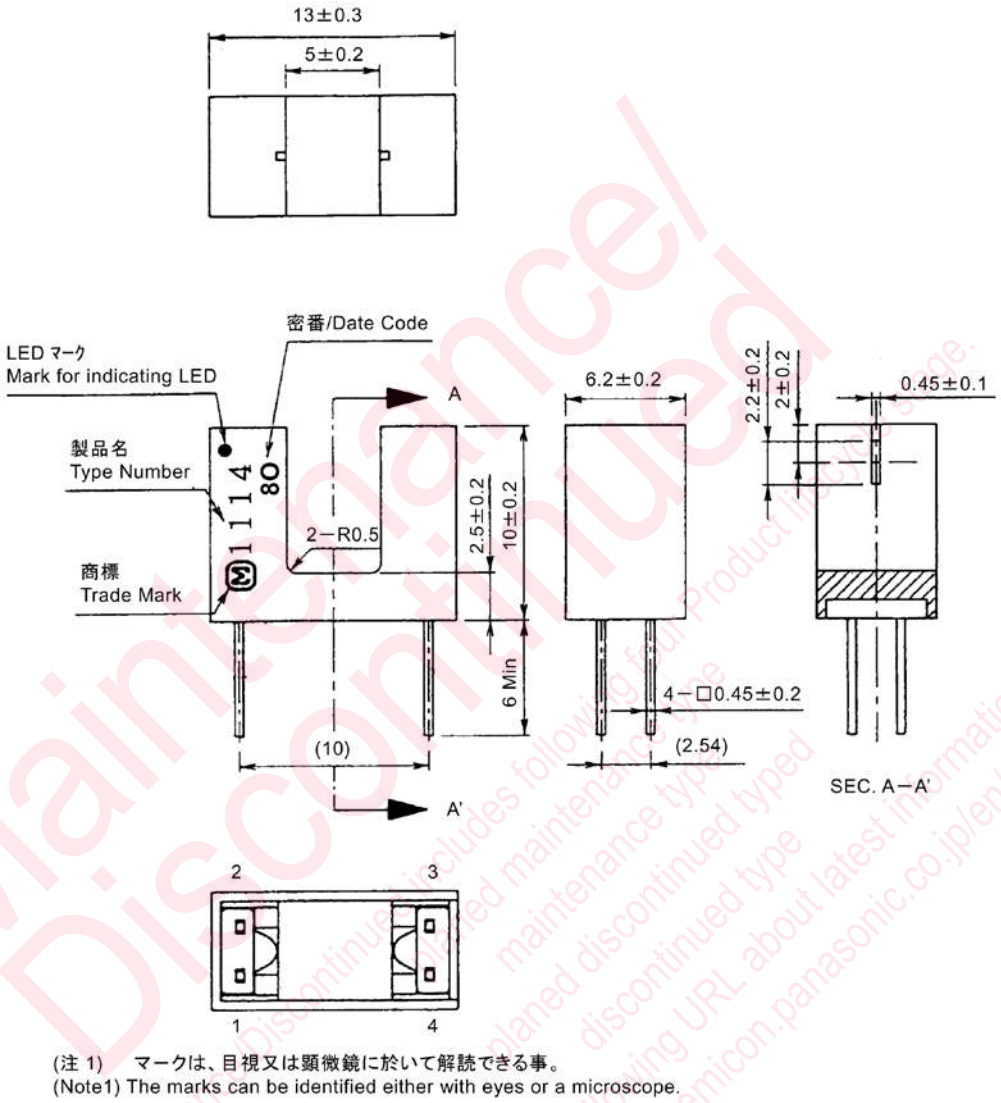


ΔI_C — d



■ Package (Unit: mm)

LSSSIR4S0005



(注 1)　マークは、目視又は顕微鏡に於いて解読できる事。
(Note1) The marks can be identified either with eyes or a microscope.

- Pin name
  1: Anode
  2: Cathode
  3: Collector
  4: Emitter

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