

ON1109

Photo Interrupter

For contactless SW, object detection

Outline

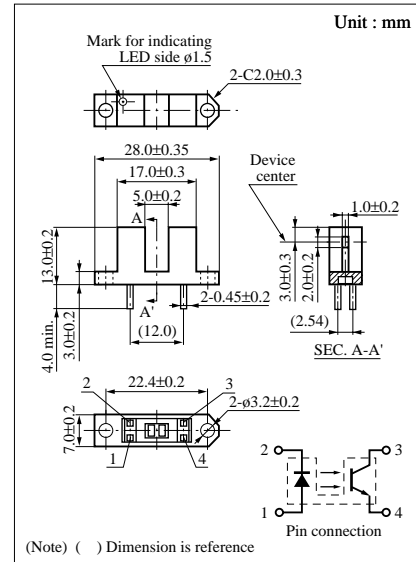
ON1109 is a photocoupler in which a high efficiency GaAs infrared light emitting diode is used as the light emitting element, and a high sensitivity phototransistor is used as the light detecting element. The two elements are arranged so as to face each other, and objects passing between them are detected.

Features

- Highly precise position detection : 0.7 mm
- Fast response : $t_r, t_f = 6 \mu s$ (typ.)
- Small output current variation against change in temperature
- Deep and wide gap between emitting and detecting elements

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 1.34 mW/°C at Ta ≥ 25°C.

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
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	$V_{CE} = 10 \text{ V}, I_F = 20 \text{ mA}$	0.3			mA
	Response time	t_r, t_f^*	$V_{CC} = 10 \text{ V}, I_C = 1 \text{ mA}, R_L = 100 \Omega$		6		μs
	Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_F = 50 \text{ mA}, I_C = 0.1 \text{ mA}$			0.3	V

* Switching time measurement circuit

