CNZ2153 (ON2153)

Reflective photosensor

Non-contact point SW, object sensing

■ Overview

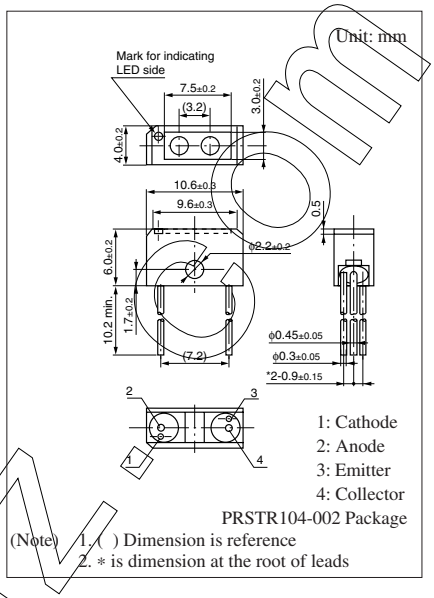
CNZ2153 is a photosensor detecting the change of reflective light in which a high efficiency GaAs infrared light emitting diode is used as the light emitting element, and a Si phototransistor is used as the light detecting element. The two elements are located parallel in the same direction and objects are detected when passing in front of the device.

■ Features

- Fast response
- Small size and light weight

■ Applications

- Detection of paper, film and cloth
- Optical mark reading
- Detection of coin and bill
- Detection of position and edge
- Start, end mark detection of magnetic tape



(Note) 1. ( ) Dimension is reference
2. ∗ is dimension at the root of leads

■ Absolute Maximum Ratings $T_a = 25°C$

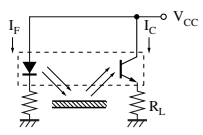
Parameter		Symbol	Rating	Unit
Input (Light emitting diode)	Reverse voltage	V_R	3	V
	Forward current	I_F	50	mA
	Power dissipation *1	P_D	75	mW
Output (Photo transistor)	Collector-emitter voltage (Base open)	V_{CEO}	30	V
	Emitter-collector voltage (Base open)	V_{ECO}	5	V
	Collector current	I_C	20	mA
	Collector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

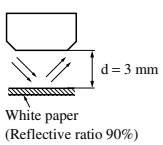
Note) ∗1: Input power derating ratio is 1.0 mW/°C at $T_a \geq 25°C$.
∗2: Output power derating ratio is 0.67 mW/°C at $T_a \geq 25°C$.

■ Electrical-Optical Characteristics $T_a = 25°C \pm 3°C$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Forward voltage	V_F	I_F = 50 mA		1.2	1.5	V
	Reverse current	I_R	V_R = 3 V			10	μA
	Terminal capacitance	C_t	V_R = 0 V, f = 1 MHz		50		pF
Output characteristics	Collector-emitter cutoff current (Base open)	I_{CEO}	V_{CE} = 10 V			0.2	μA
Transfer characteristics	Collector current *1, 2	I_C	V_{CC} = 5 V, I_F = 20 mA, R_L = 100 Ω	100		1200	μA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	I_F = 50 mA, I_C = 0.1 mA			0.5	V
	Rise time	t_r	V_{CC} = 10 V, I_C = 0.1 mA, R_L = 100 Ω		6.0		μs
	Fall time	t_f			6.0		μs

Note) 1. Input and output are handled electrically.
2. This product is not designed to withstand radiation
3. ∗1: Output current measurement circuit
(Ambient light is shut off completely)



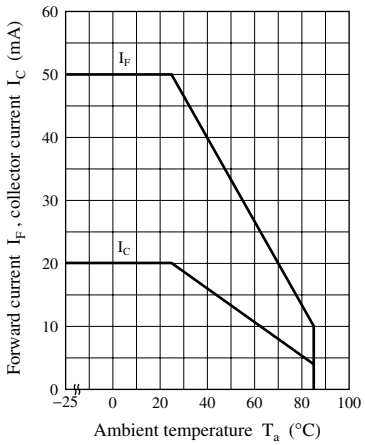


∗2: Rank classification

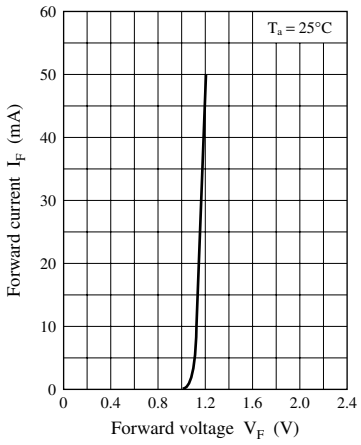
Rank	Q	R	S	No-rank
I_C (μA)	100 to 300	200 to 600	400 to 1200	100 to 1200

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

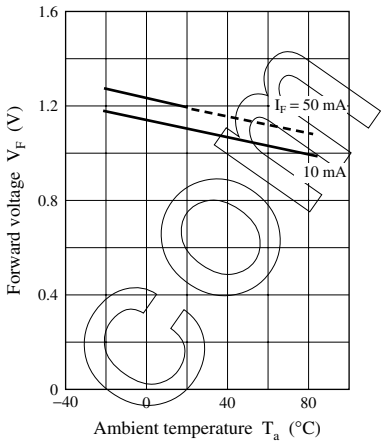
I_F , I_C — T_a



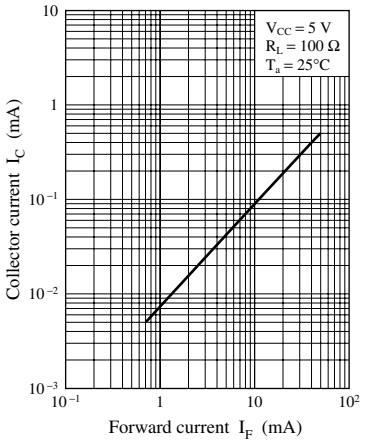
I_F — V_F



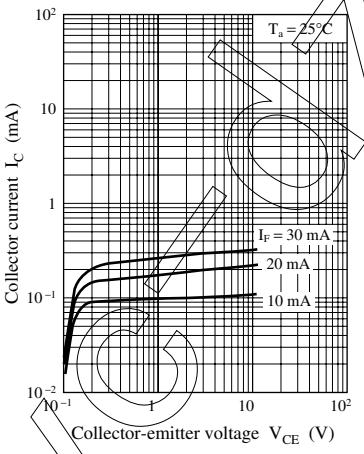
V_F — T_a



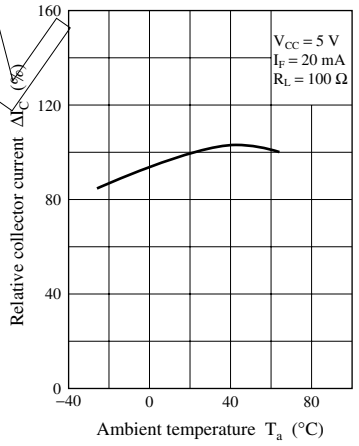
I_C — I_F



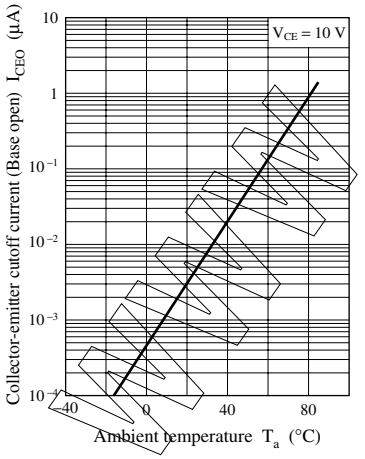
I_C — V_{CE}



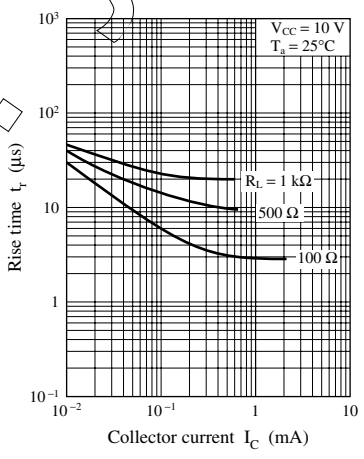
ΔI_C — T_a



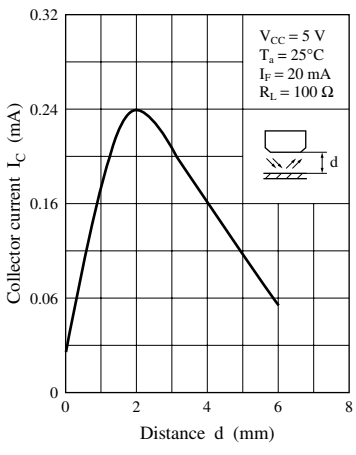
I_{CEO} — T_a



t_r — I_C



I_C — d



⚠ Caution for Safety

⚠ DANGER

■ This product contains Gallium Arsenide (GaAs).

GaAs powder and vapor are hazardous to human health if inhaled or ingested. Do not burn, destroy, cut, cleave off, or chemically dissolve the product. Follow related laws and ordinances for disposal. The product should be excluded form general industrial waste or household garbage.

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