CNZ2152 (ON2152)

Reflective photosensor

Non-contact point SW, object sensing

■ Overview

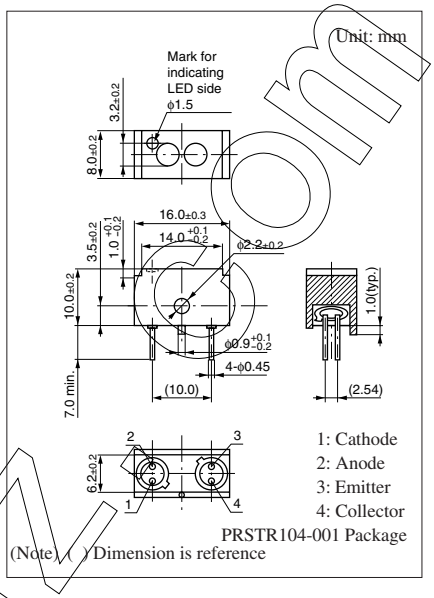
CNZ2152 is a photosensor detecting the change of reflective light in which a high efficiency GaAs infrared light emitting diode is used as the light emitting element, and a high sensitivity Si phototransistor is used as the light detecting element. The two elements are located parallel in the same direction and objects are detected when passing in front of the device.

■ Features

- Fast response
- High sensitivity
- High SN ratio

■ 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



■ Absolute Maximum Ratings $T_a = 25°C$

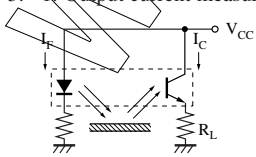
Parameter		Symbol	Rating	Unit
Input (Light emitting diode)	Reverse voltage	V_R	3	V
	Forward current	I_F	100	mA
	Power dissipation *1	P_D	150	mW
Output (Photo transistor)	Collector-emitter voltage (Base open)	V_{CEO}	20	V
	Emitter-collector voltage (Base open)	V_{ECO}	3	V
	Collector current	I_C	30	mA
	Collector power dissipation *2	P_C	150	mW
Temperature	Operating ambient temperature	T_{opr}	−25 to +85	°C
	Storage temperature	T_{stg}	−30 to +100	°C

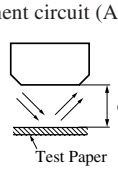
Note) ∗1: Input power derating ratio is 2.0 mW/°C at $T_a \geq 25°C$.
∗2: Output power derating ratio is 2.0 mW/°C at $T_a \geq 25°C$.

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

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Forward voltage	V_F	$I_F = 100$ mA		1.25	1.50	V
	Reverse current	I_R	$V_R = 5$ V			10	μA
Output characteristics	Collector-emitter cutoff current (Base open)	I_{CEO}	$V_{CE} = 10$ V		0.05	2.00	μA
Transfer characteristics	Collector current *1	I_C *2	$V_{CC} = 5$ V, $I_F = 20$ mA, $R_L = 100$ Ω	0.8	3.0		mA
		I_C *3			500		μA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F = 100$ mA, $I_C = 1$ mA			0.6	V
	Rise time	t_r	$V_{CC} = 10$ V, $I_C = 1$ mA, $R_L = 100$ Ω		8		μs
	Fall time	t_f			8		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)

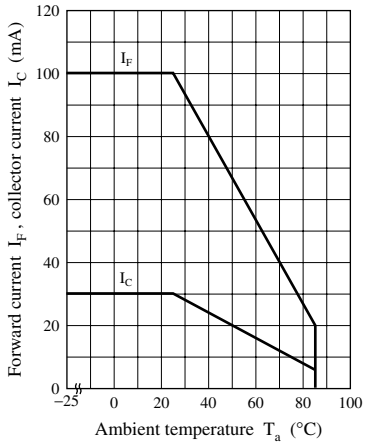




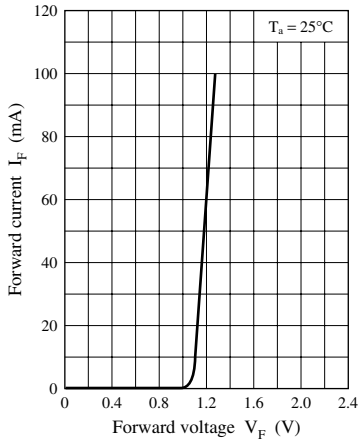
∗2: White paper (reflective ratio 90%)
∗3: Tracing paper (paper SM-1 for 2nd original paper)

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

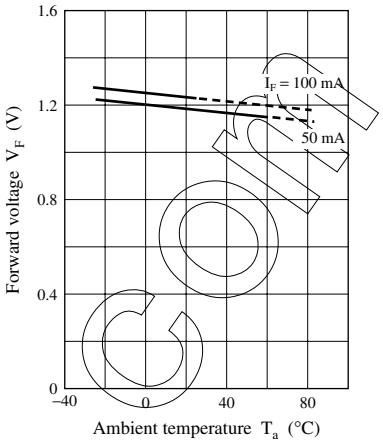
I_F , I_C — T_a



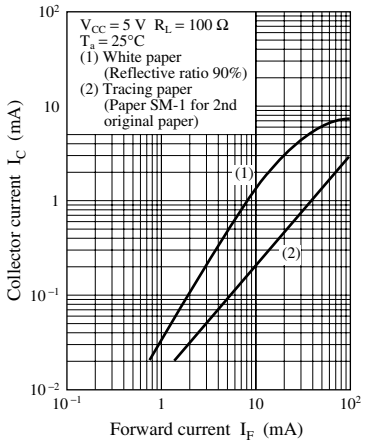
I_F — V_F



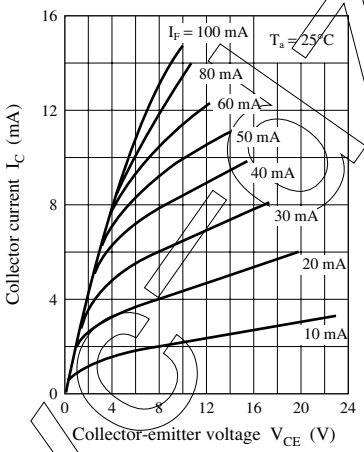
V_F — T_a



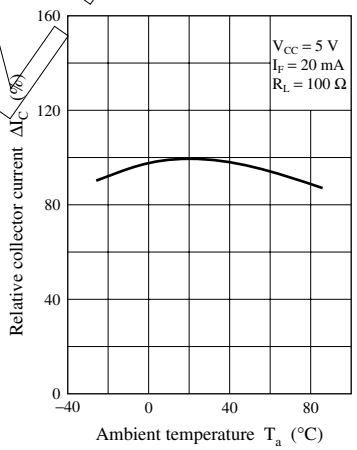
I_C — I_F



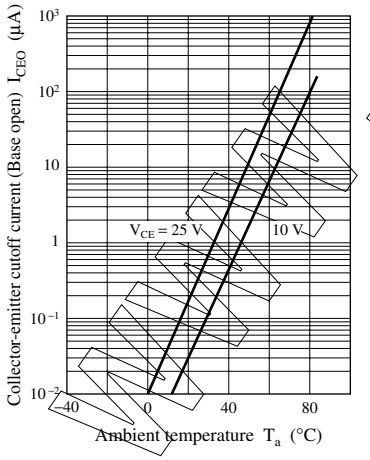
I_C — V_{CE}



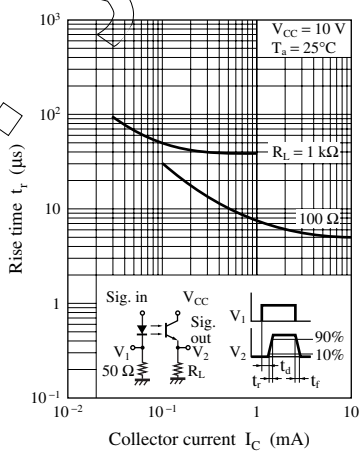
ΔI_C — T_a



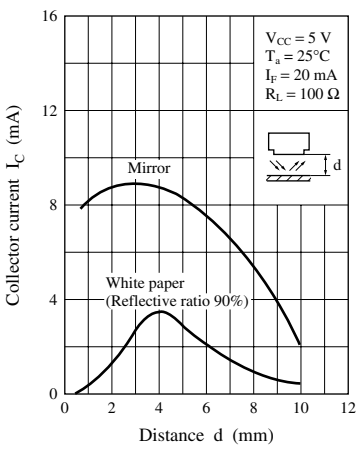
I_{CEO} — T_a



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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