CNZ2253 (ON2253)

Reflective Photosensor

For contactless SW and object detection

■ Overview

CNZ2253 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 Darlington 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

- High sensitivity
- Small size, 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

■ Absolute Maximum Ratings $T_a = 25°C$

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}	20	V
	Emitter-collector voltage (Base open)	V_{ECO}	5	V
	Collector current	I_C	30	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 $T_a \geq 25°C$

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

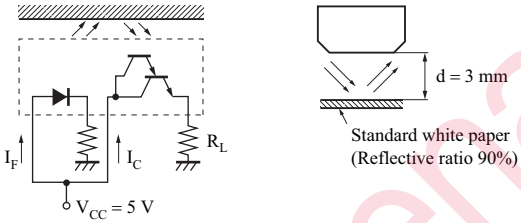
■ Electrical-Optical Characteristics T_a = 25°C±3°C

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
	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			0.5	µA
Transfer characteristics	Collector current *1, *2	I_C	V_{CC} = 5 V, I_F = 10 mA, R_L = 100 Ω	3		30	mA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	I_F = 50 mA, I_C = 1 mA			1.5	V
	Rise time *3	t_r	V_{CC} = 10 V, I_C = 1 mA, R_L = 100 Ω		150		µs
	Fall time *3	t_f			150		µs

Note) 1. Input and output are practiced by electricity.

2. This device is designed by disregarding radiation.

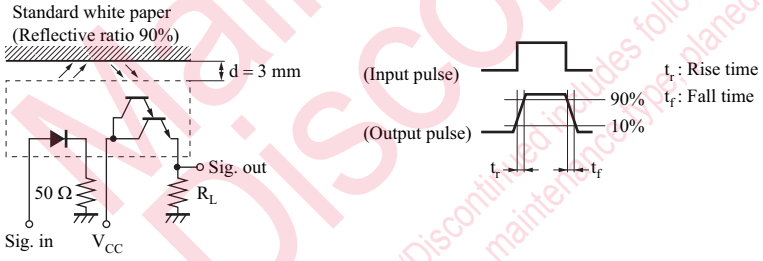
3. *1: Output current measurement circuit



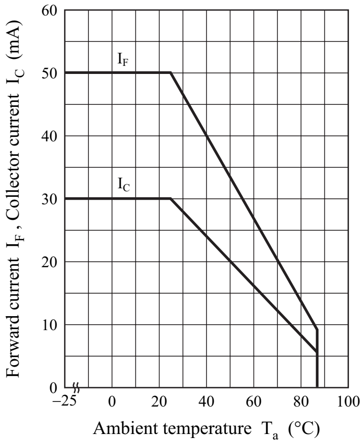
*2: Rank classification

Rank	Q	R	S	N0-rank
I_C (mA)	3 to 9	6 to 18	12 to 30	3 to 30

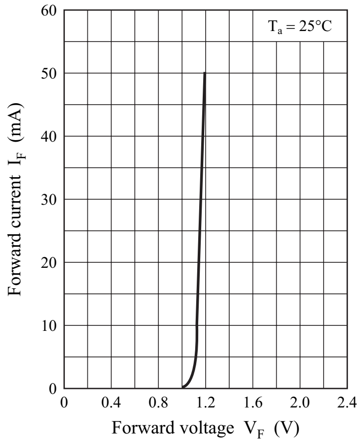
*3: Switching time measurement circuit



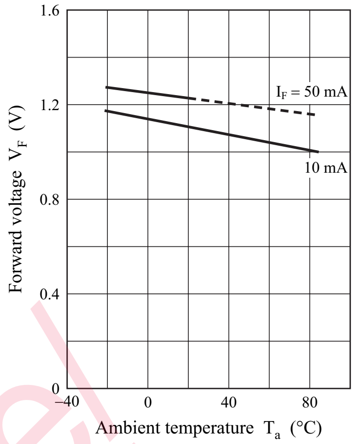
I_F , I_C — T_a



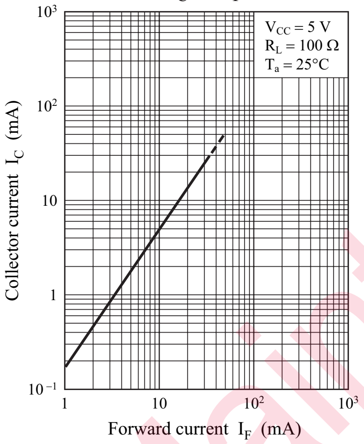
I_F — V_F



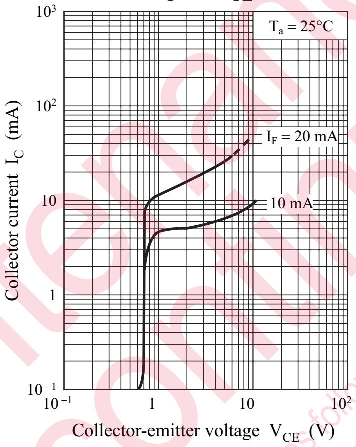
V_F — T_a



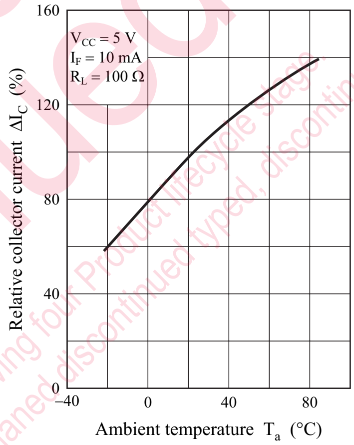
I_C — I_F



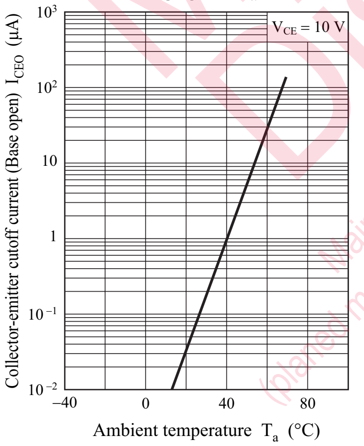
I_C — V_{CE}



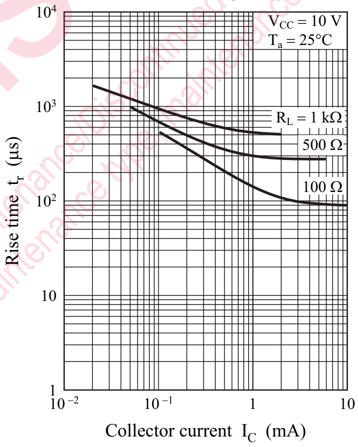
ΔI_C — T_a



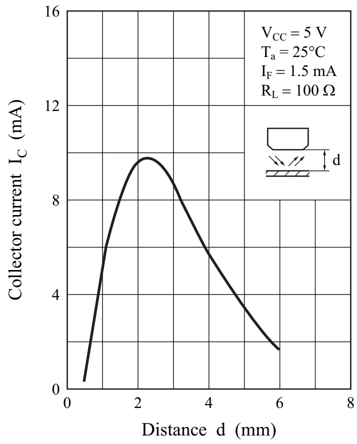
I_{CEO} — T_a



t_r — I_C

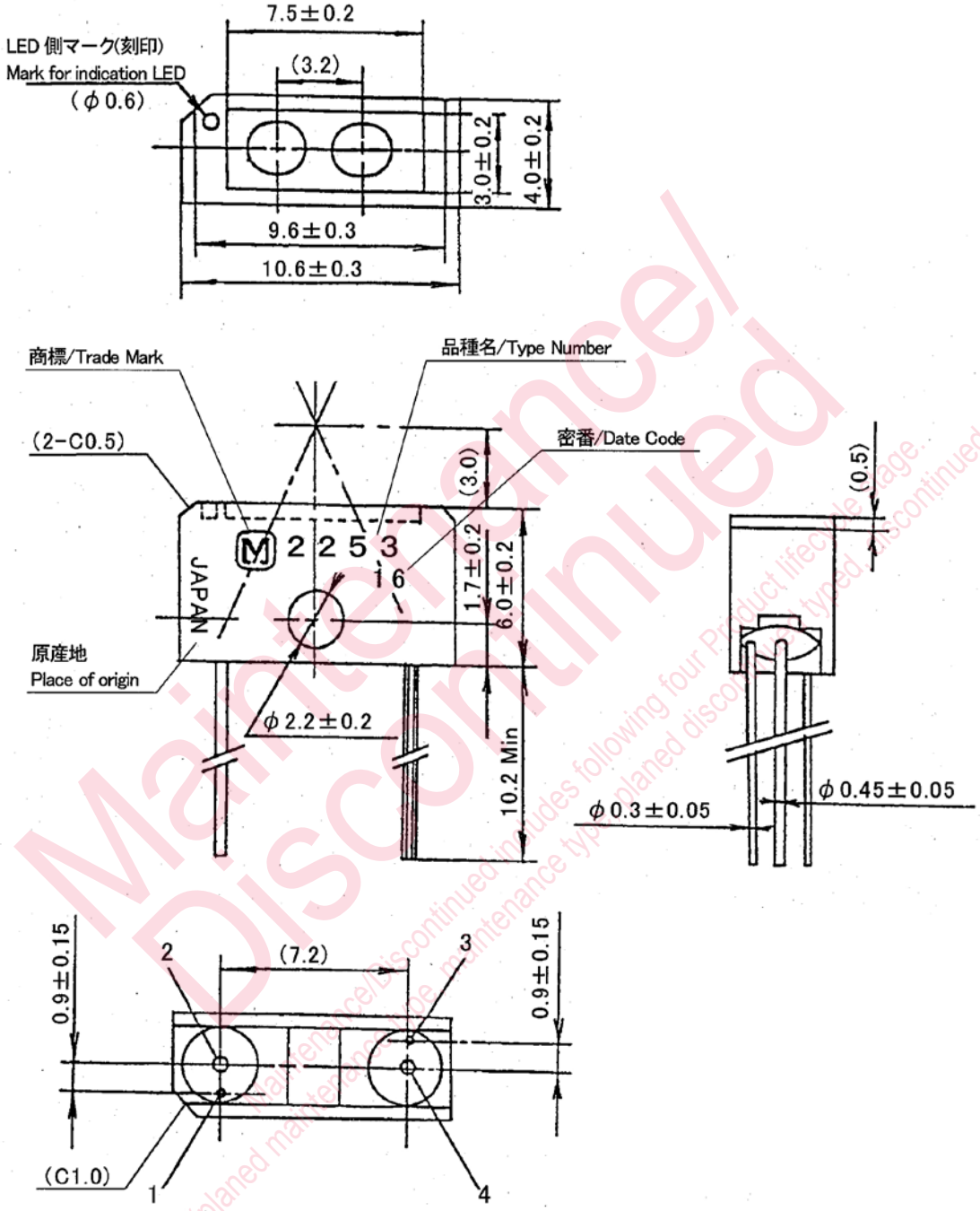


I_C — d



■ Package (Unit: mm)

LSSLRR4S0001



(注 1) 密番及びマークは、目視又は顕微鏡に於いて解読できる事。
(Note1) What a date code and mark sees an attention and can decode in a microscope.

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

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