This product complies with the RoHS Directive (EU 2002/95/EC).

CNZ2153 (ON2153)

Reflective Photosensor

For contactless SW and object detection

■ 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, 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}	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
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 $T_a \geq 25°C$

Maintenance/ Discontinued
Maintenance/discontinued includes following Product lifecycle stage.
planned maintenance type
planned discontinued typed
discontinued type
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Note) The part number in the parenthesis shows conventional part number.

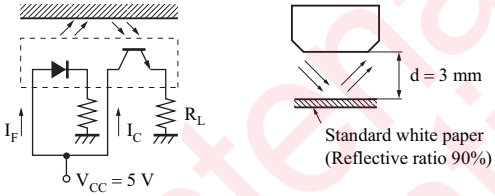
■ Electrical-Optical Characteristics T_a = 25°C±3°C

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			0.2	µA
Transfer characteristics	Collector current *1, *2	I_C	V_{CC} = 5 V, I_F = 20 mA, R_L = 100 Ω	100		1 200	µA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	I_F = 50 mA, I_C = 0.1 mA			0.5	V
	Rise time *3	t_r	V_{CC} = 10 V, I_C = 0.1 mA, R_L = 100 Ω		6.0		µs
	Fall time *3	t_f			6.0		µs

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

2. This device is designed by disregarding radiation.

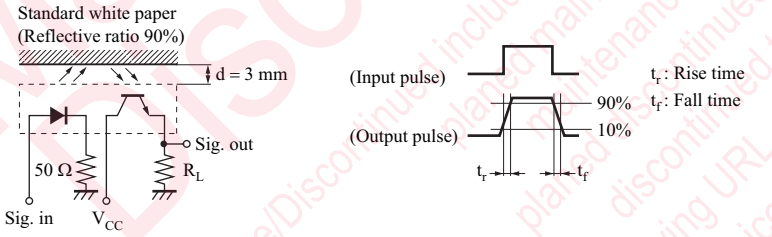
3. ∗1: Output current measurement circuit



∗2: Rank classification

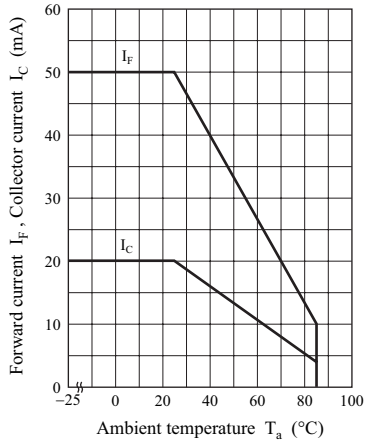
Rank	Q	R	S	No-rank
I_C (µA)	100 to 300	200 to 600	400 to 1 200	100 to 1 200

∗3: Switching time measurement circuit

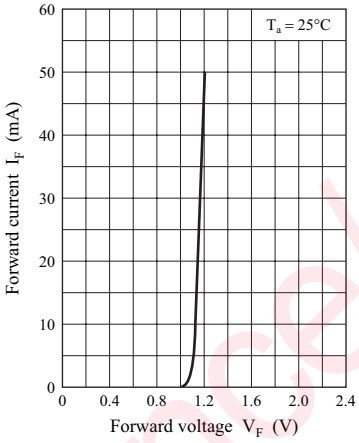


Maintenance/Discontinued
Maintenance/Discontinued includes following four Product lifecycle stage
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maintenance type
planned discontinued type
discontinued type
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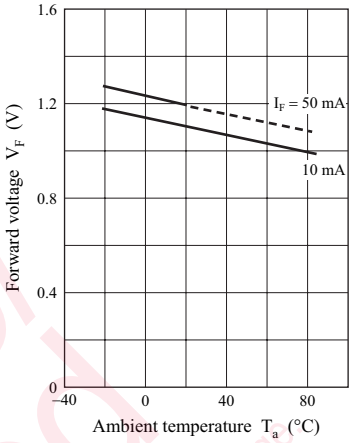
I_F , I_C — T_a



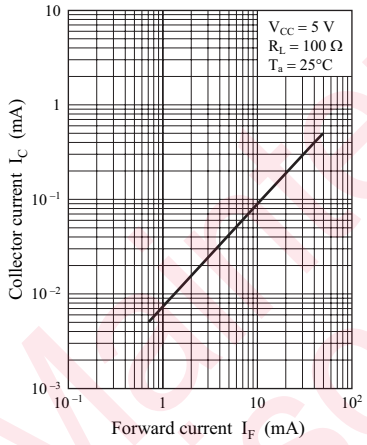
I_F — V_F



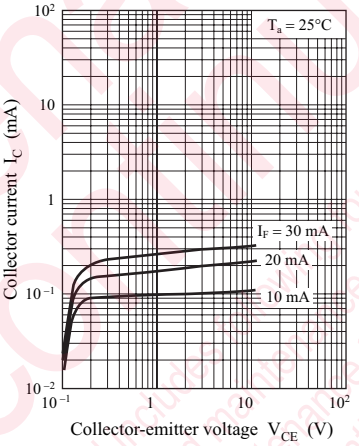
V_F — T_a



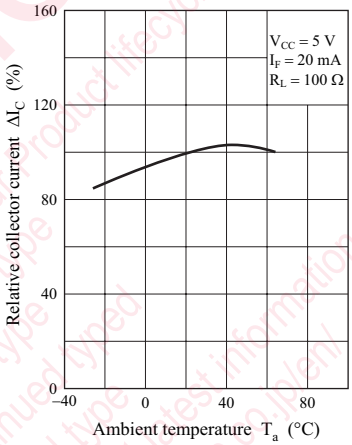
I_C — I_F



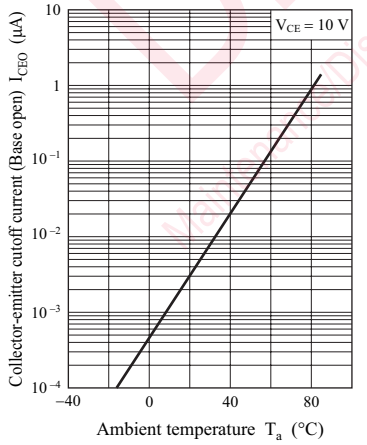
I_C — V_{CE}



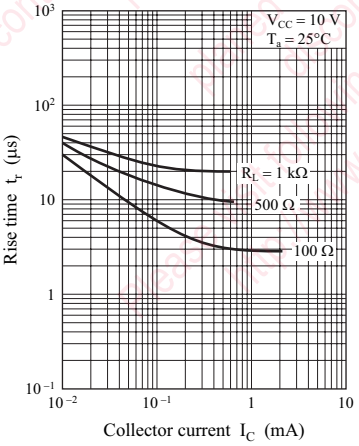
ΔI_C — T_a



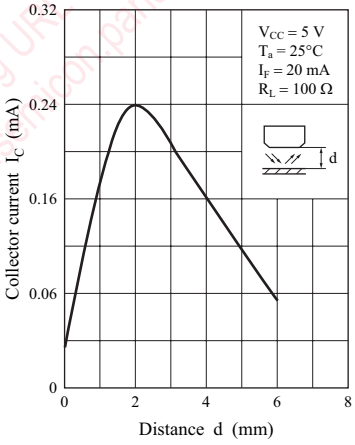
I_{CEO} — T_a



t_r — I_C



I_C — d

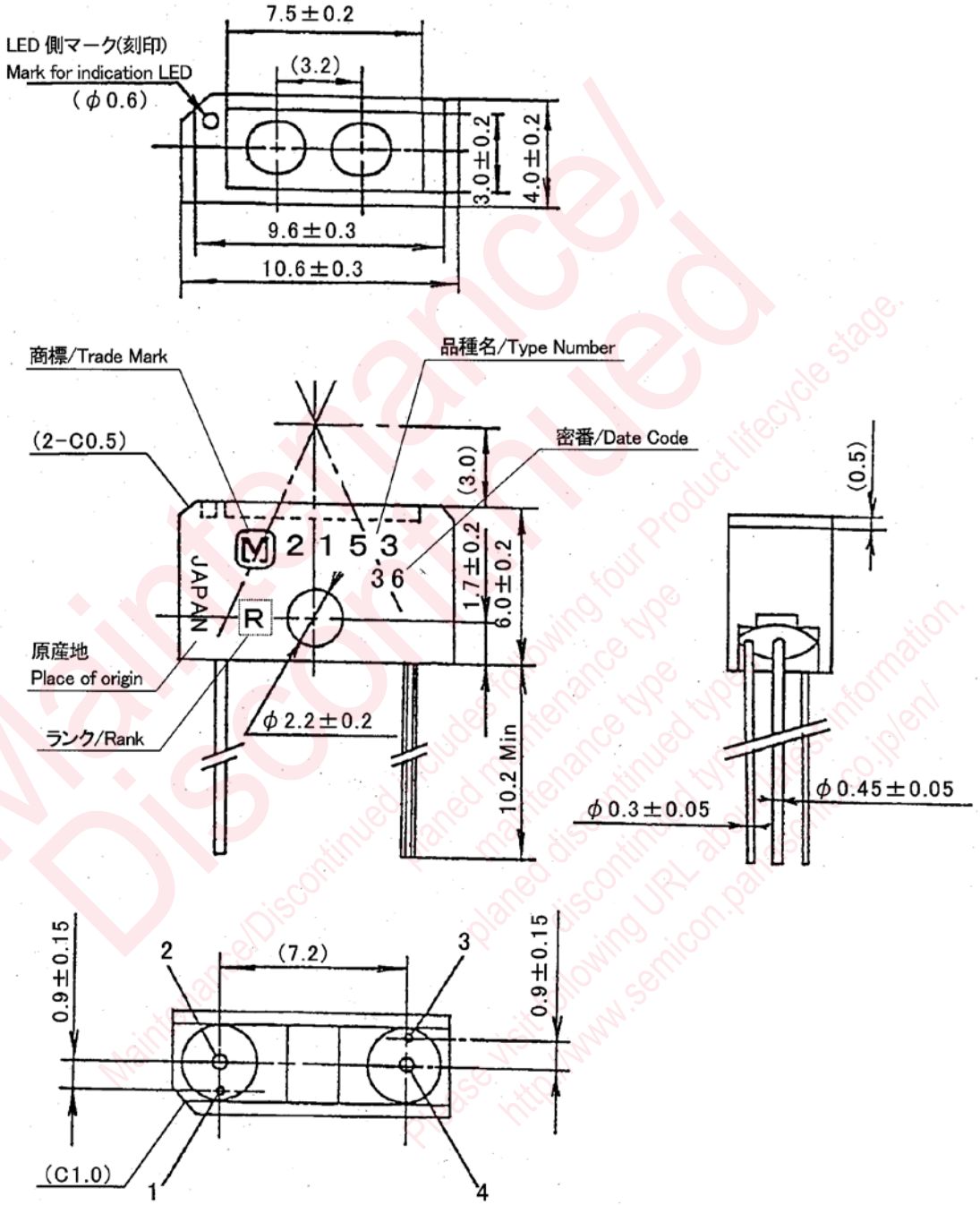


Maintenance/ Discontinued

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■ 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.

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

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