

# 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 $T_a = 25^\circ\text{C}$

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	$^\circ\text{C}$
Storage temperature		$T_{stg}$	-30 to +100	$^\circ\text{C}$

Note) \*1: Input power derating ratio is 1.0 mW/ $^\circ\text{C}$  at  $T_a \geq 25^\circ\text{C}$

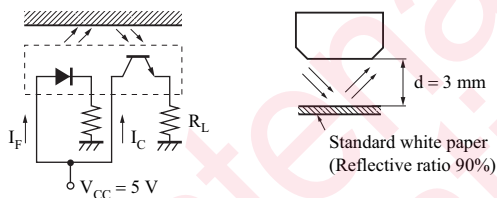
\*2: Output power derating ratio is 0.67 mW/ $^\circ\text{C}$  at  $T_a \geq 25^\circ\text{C}$

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

■ Electrical-Optical Characteristics  $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

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

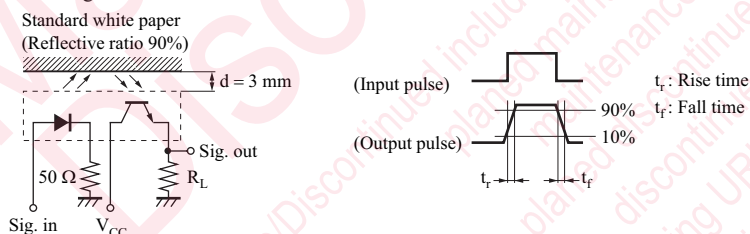
- Note) 1. Input and output are practiced by electricity.  
 2. This device is designed by disregarding radiation.  
 3. \*1: Output current measurement circuit

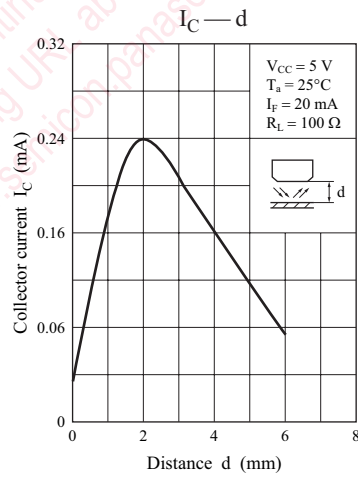
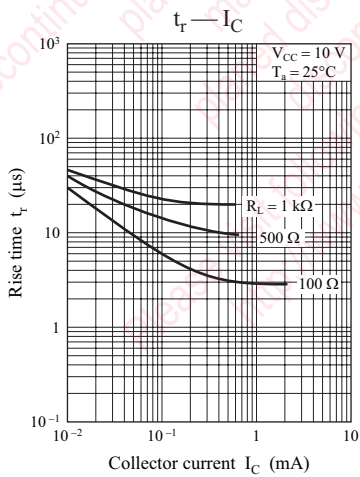
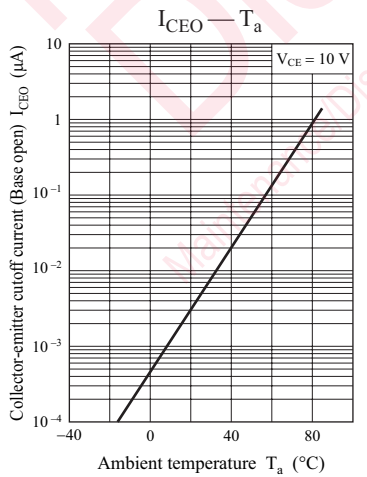
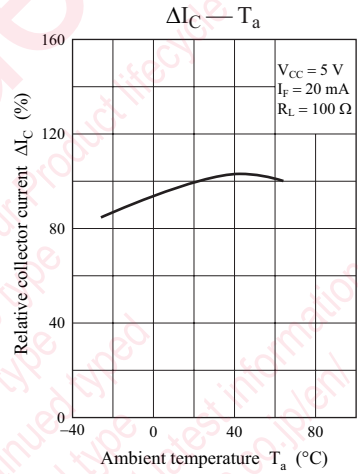
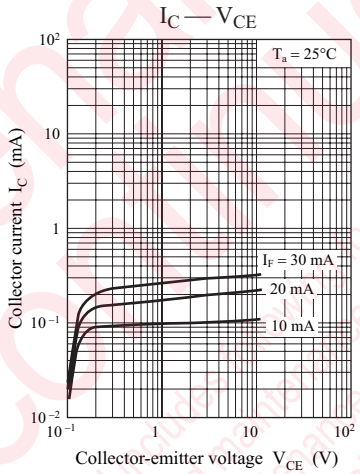
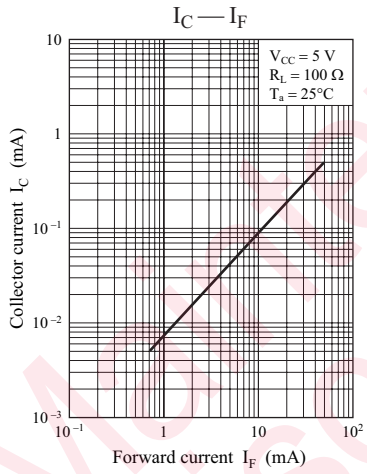
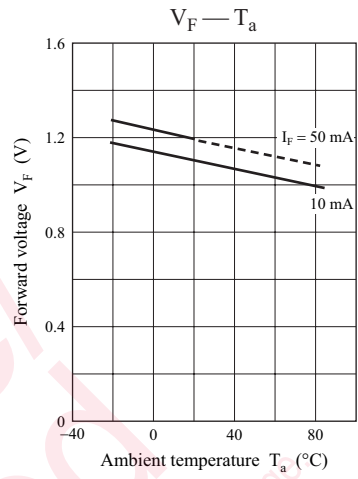
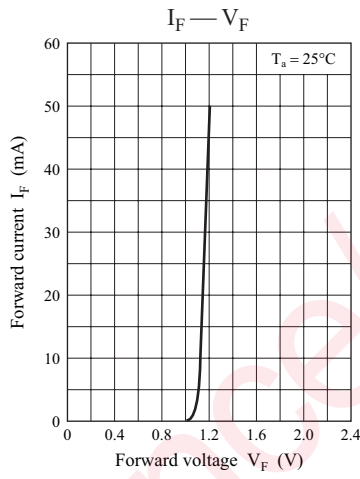
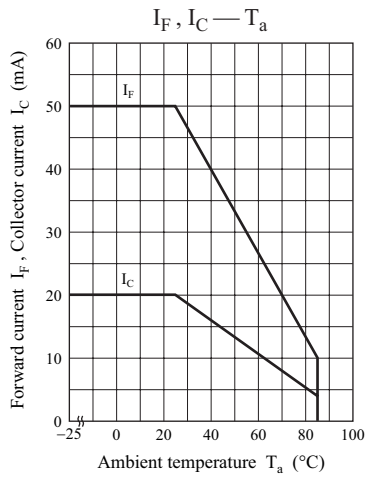


\*2: Rank classification

Rank	Q	R	S	No-rank
$I_C (\mu\text{A})$	100 to 300	200 to 600	400 to 1200	100 to 1200

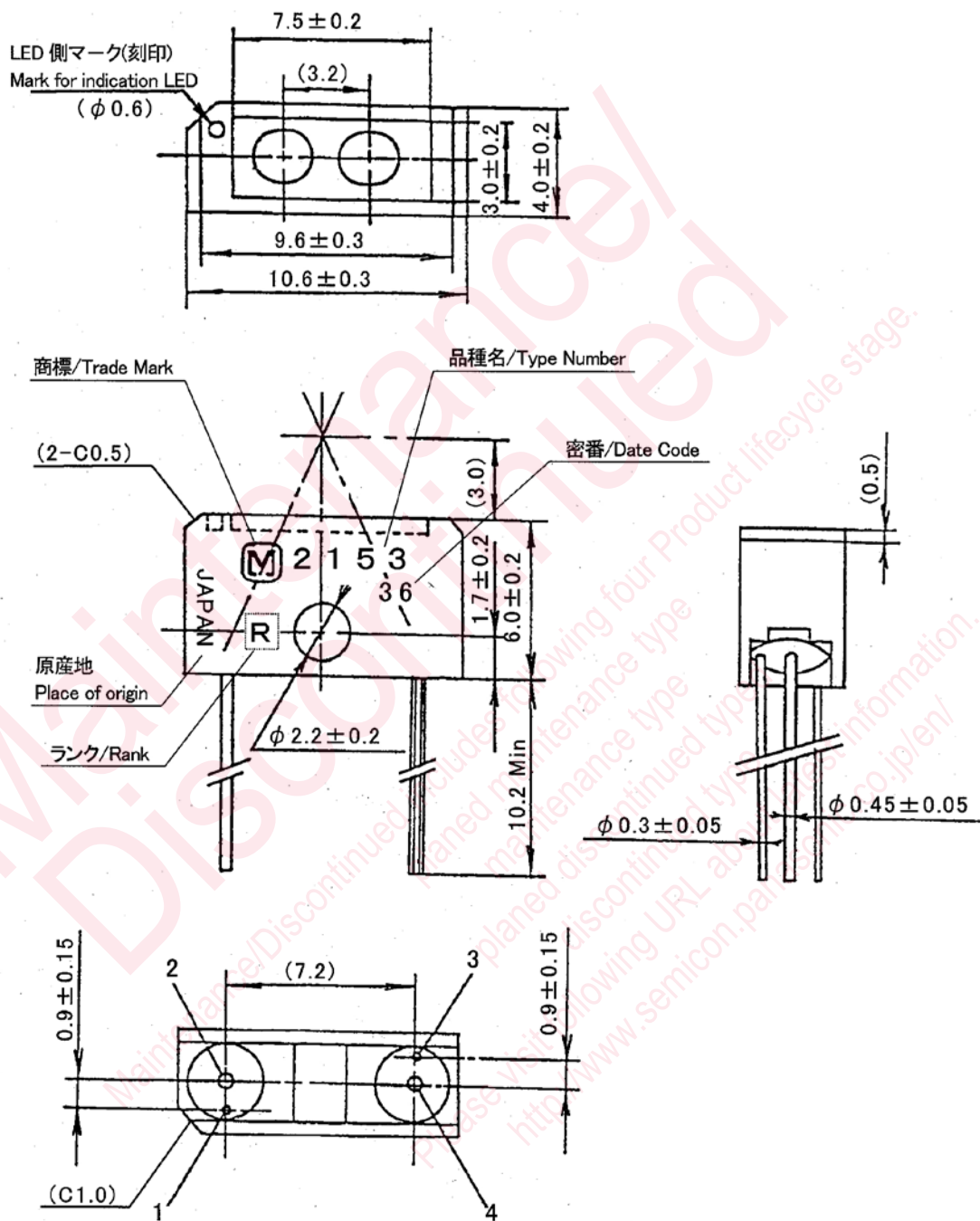
\*3: Switching time measurement circuit





■ 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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