

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 $T_a \geq 25^\circ\text{C}$

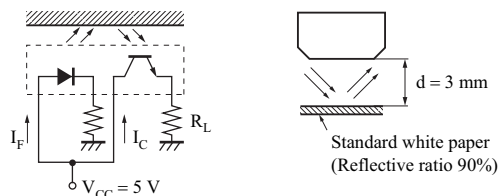
*2: Output power derating ratio is 0.67 mW/ $^\circ\text{C}$ at $T_a \geq 25^\circ\text{C}$

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	μA
	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}	$V_{\text{CE}} = 10\text{ V}$			0.2	μA
Transfer characteristics	Collector current *1, *2	I_C	$V_{\text{CC}} = 5\text{ V}, I_F = 20\text{ mA}, R_L = 100\ \Omega$	100		1200	μA
	Collector-emitter saturation voltage	$V_{\text{CE(sat)}}$	$I_F = 50\text{ mA}, I_C = 0.1\text{ mA}$			0.5	V
	Rise time *3	t_r	$V_{\text{CC}} = 10\text{ V}, I_C = 0.1\text{ mA}, R_L = 100\ \Omega$		6.0		μs
	Fall time *3	t_f	$R_L = 100\ \Omega$		6.0		μs

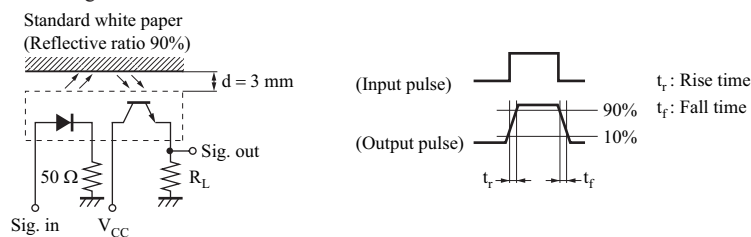
- Note) 1. Input and output are practiced by electricity.
 2. This device is designed by disregarding radiation.
 3. *1: Output current measurement circuit

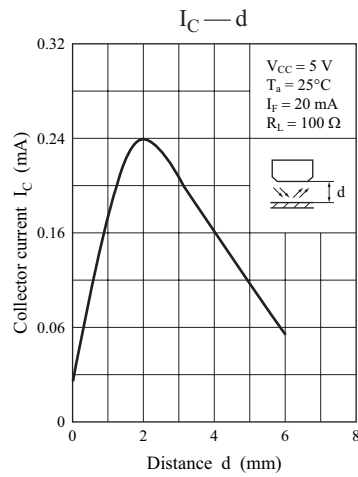
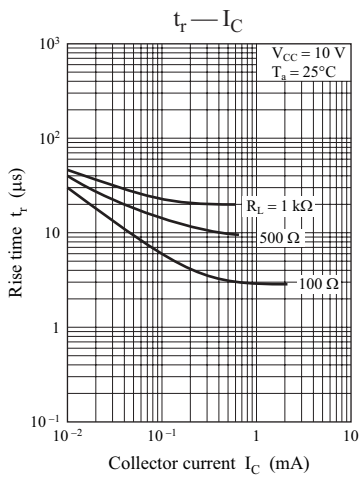
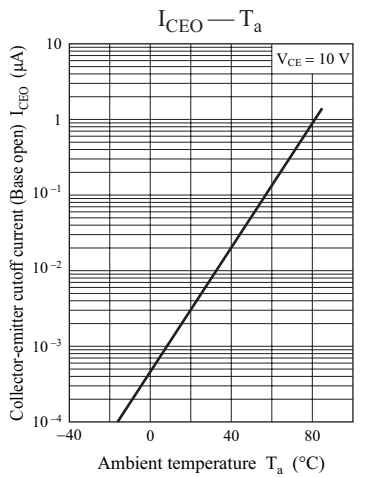
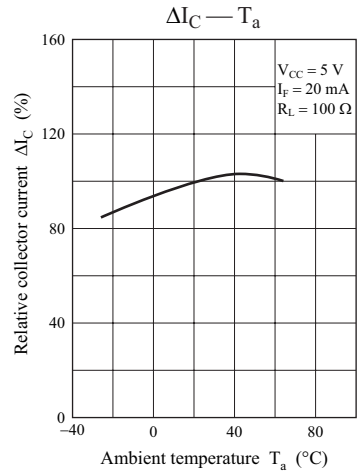
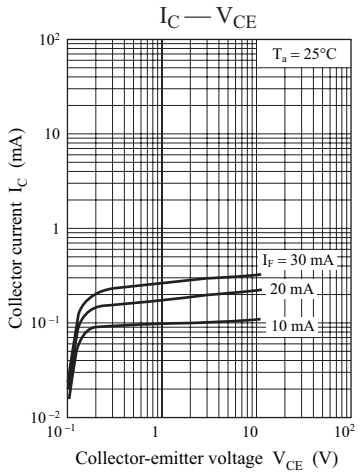
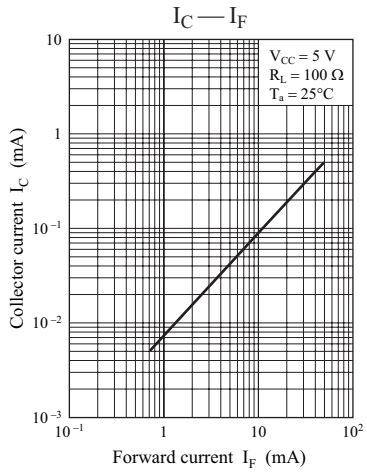
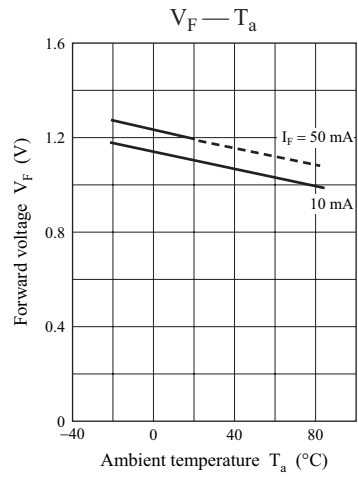
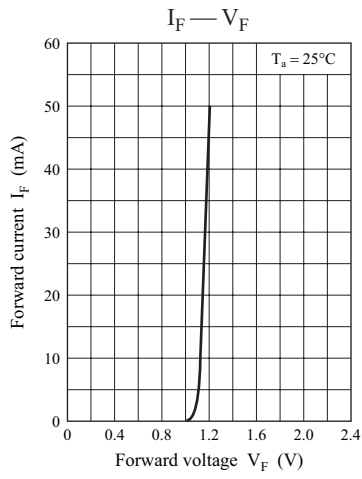
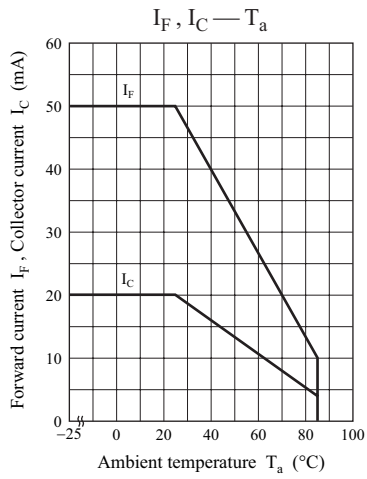


*2: Rank classification

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

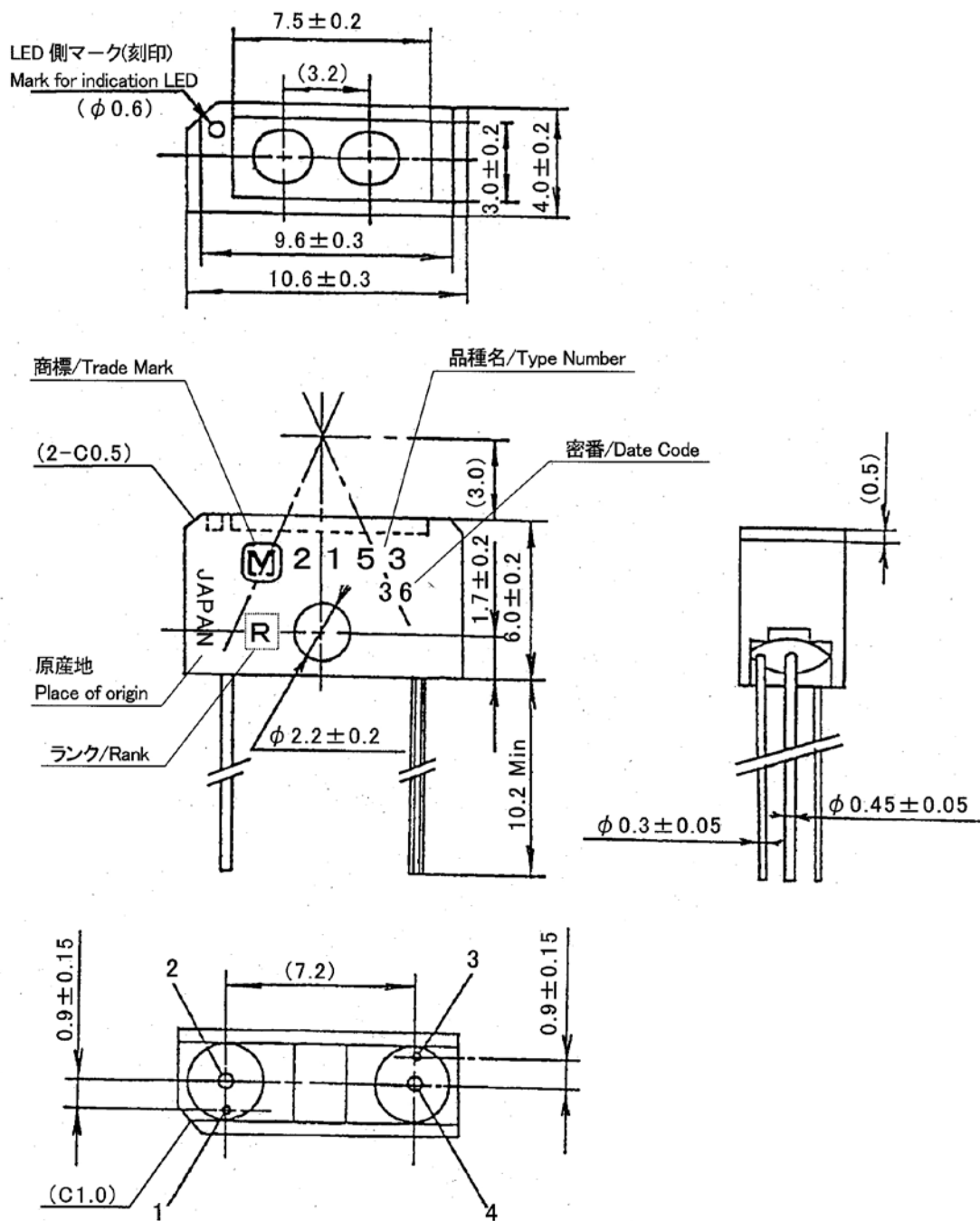
*3: Switching time measurement circuit





■ 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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