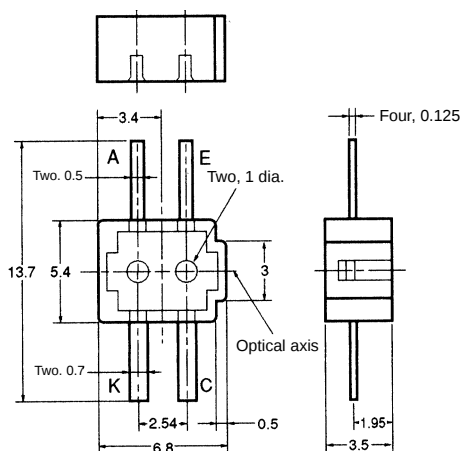
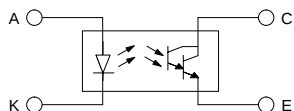


■ Dimensions

Note: All units are in millimeters unless otherwise indicated.



Internal Circuit



Unless otherwise specified, the tolerances are as shown below.

Terminal No.	Name
A	Anode
K	Cathode
C	Collector
E	Emitter

Dimensions	Tolerance
3 mm max.	±0.3
3 < mm ≤ 6	±0.375
6 < mm ≤ 10	±0.45
10 < mm ≤ 18	±0.55
18 < mm ≤ 30	±0.65

■ Features

- The LED requires a forward current of only 5 mA due to the Photo-Darlington transistor built into the detector.
- With a red LED light source.

■ Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Rated value
Emitter	Forward current	I_F	15 mA (see note 1)
	Pulse forward current	I_{FP}	---
	Reverse voltage	V_R	4 V
Detector	Collector–Emitter voltage	V_{CEO}	24 V
	Emitter–Collector voltage	V_{ECO}	---
	Collector current	I_C	20 mA
	Collector dissipation	P_C	50 mW (see note 1)
Ambient temperature	Operating	T_{opr}	–20°C to 60°C
	Storage	T_{stg}	–20°C to 80°C
Soldering temperature		T_{sol}	260°C (see note 2)

Note:

1. Refer to the temperature rating chart if the ambient temperature exceeds 25°C.
2. Complete soldering within 10 seconds.

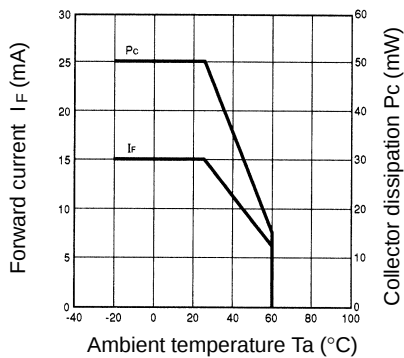
■ Electrical and Optical Characteristics (Ta = 25°C)

Item		Symbol	Value	Condition
Emitter	Forward voltage	V_F	2.0 V typ., 2.6 V max.	$I_F = 15 \text{ mA}$
	Reverse current	I_R	0.01 μA typ., 5 μA max.	$V_R = 4 \text{ V}$
	Peak emission wavelength	λ_P	700 nm typ.	$I_F = 10 \text{ mA}$
Detector	Light current	I_L	0.3 μA min., 8.0 μA max.	$I_F = 5 \text{ mA}$, $V_{CE} = 10 \text{ V}$ White paper with a reflection ratio of 90%, $d = 4 \text{ mm}$ (see note)
	Dark current	I_D	2 nA typ., 250 nA max.	$V_{CE} = 10 \text{ V}$, 0 lx
	Leakage current	I_{LEAK}	---	---
	Collector-Emitter saturated voltage	$V_{CE}(\text{sat})$	---	---
	Peak spectral sensitivity wavelength	λ_P	750 nm typ.	$V_{CE} = 10 \text{ V}$
Rising time		t_r	180 μs typ.	$V_{CC} = 5 \text{ V}$, $R_L = 100 \Omega$, $I_L = 1 \text{ mA}$
Falling time		t_f	60 μs typ.	$V_{CC} = 5 \text{ V}$, $R_L = 100 \Omega$, $I_L = 1 \text{ mA}$

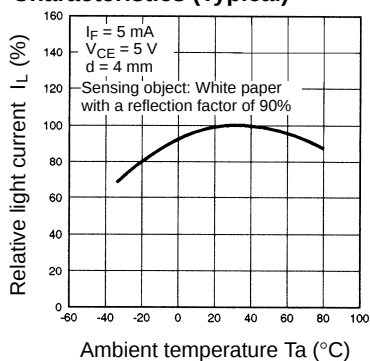
Note: The letter “d” indicates the distance between the top surface of the sensor and the sensing object.

Engineering Data

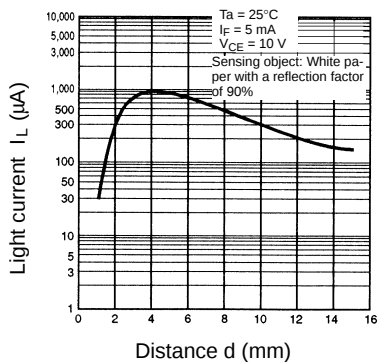
Forward Current vs. Collector Dissipation Temperature Rating



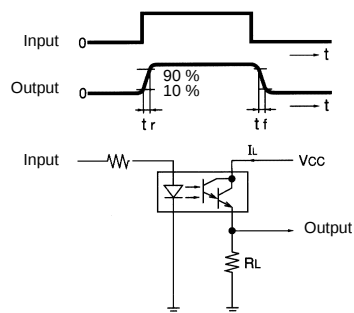
Relative Light Current vs. Ambient Temperature Characteristics (Typical)



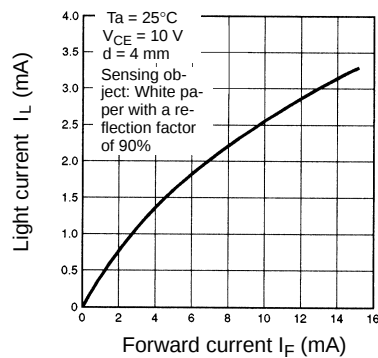
Sensing Distance Characteristics (Typical)



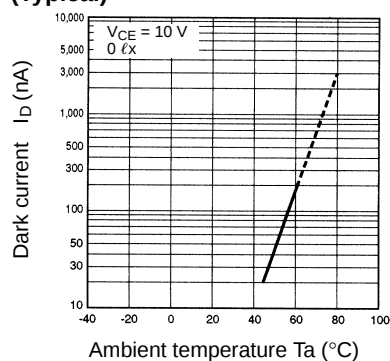
Response Time Measurement Circuit



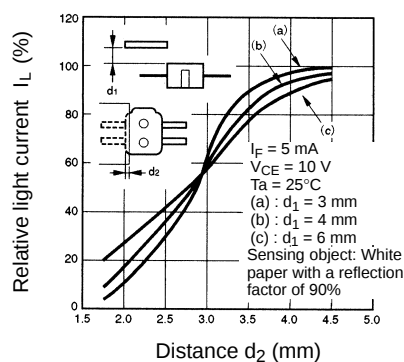
Light Current vs. Forward Current Characteristics (Typical)



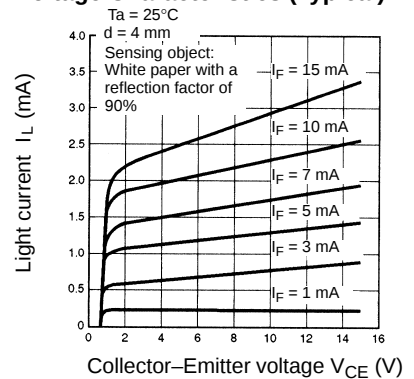
Dark Current vs. Ambient Temperature Characteristics (Typical)



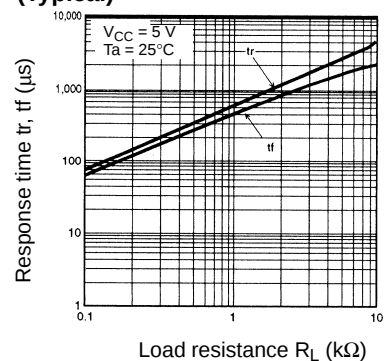
Sensing Position Characteristics (Typical)



Light Current vs. Collector-Emitter Voltage Characteristics (Typical)



Response Time vs. Load Resistance Characteristics (Typical)



Sensing Angle Characteristics (Typical)

