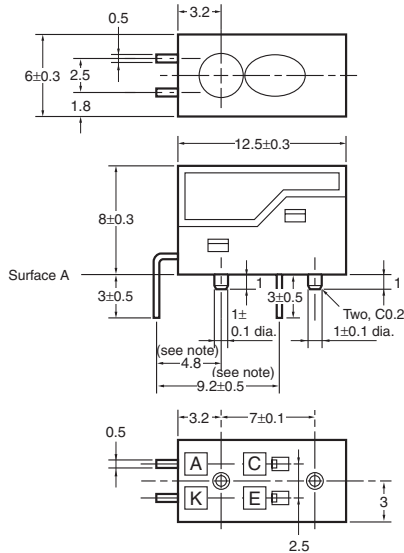# OMRON

Photomicrosensor (Reflective)
EE-SY169B

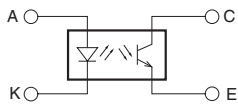⚠ **Be sure to read *Precautions* on page 25.**

■ Dimensions

Note: All units are in millimeters unless otherwise indicated.

Internal Circuit

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

Note: These dimensions are for the surface A. Other lead wire pitch dimensions are for the housing surface.
Unless otherwise specified, the tolerances are as shown below.

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

- High-quality model with plastic lenses.
- Highly precise sensing range with a tolerance of ±0.6 mm horizontally and vertically.
- With a red LED sensing dyestuff-type links.
- Limited reflective model
- Higher gain than EE-SY169.
- Possible to get the same I_L as EE-SY169 with I_F=10 mA. (half of EE-SY169 condition)

■ Absolute Maximum Ratings (Ta = 25°C)

	Item	Symbol	Rated value
Emitter	Forward current	I_F	40 mA (see note 1)
	Pulse forward current	I_{FP}	300 mA (see note 2)
	Reverse voltage	V_R	3 V
Detector	Collector–Emitter voltage	V_{CEO}	30 V
	Emitter–Collector voltage	V_{ECO}	---
	Collector current	I_C	20 mA
	Collector dissipation	P_C	100 mW (see note 1)
Ambient temperature	Operating	Topr	0°C to 70°C
	Storage	Tstg	−20°C to 80°C
Soldering temperature		Tsol	260°C (see note 3)

Note: 1. Refer to the temperature rating chart if the ambient temperature exceeds 25°C.
  2. The pulse width is 10 µs maximum with a frequency of 100 Hz.
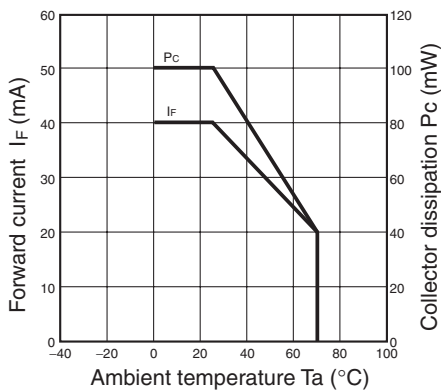 **3.** Complete soldering within 10 seconds.

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

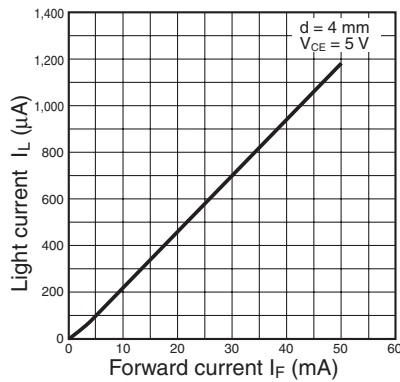|	Item	Symbol	Value	Condition
Emitter	Forward voltage	V_F	1.85 V typ., 2.3 V max.	I_F = 20 mA
	Reverse current	I_R	0.01 µA typ., 10 µA max.	V_R = 3 V
	Peak emission wavelength	λ_P	660 nm typ.	I_F = 20 mA
Detector	Light current	I_L	160 µA min., 2,000 µA max.	I_F = 10 mA, V_{CE} = 5 V White paper with a reflection ratio of 90%, d = 4 mm (see note)
	Dark current	I_D	2 nA typ., 200 nA max.	V_{CE} = 5 V, 0 ℓx
	Leakage current	I_{LEAK}	2 µA max.	I_F = 20 mA, V_{CE} = 5 V with no reflection
	Collector–Emitter saturated voltage	V_{CE} (sat)	---	---
	Peak spectral sensitivity wavelength	λ_P	850 nm typ.	V_{CE} = 5 V
Rising time		tr	30 µs typ.	V_{CC} = 5 V, R_L = 1 kΩ, I_L = 1 mA
Falling time		tf	30 µs typ.	V_{CC} = 5 V, R_L = 1 kΩ, I_L = 1 mA

Note: The letter "d" indicates the distance between the top surface of the sensor and the sensing object.
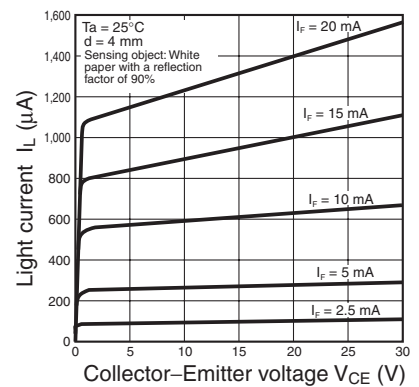
■ Engineering Data
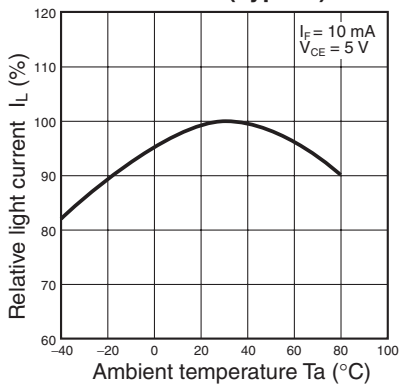
Forward Current vs. Collector Dissipation Temperature Rating

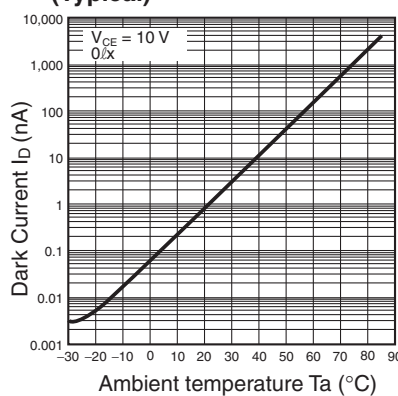**Light Current vs. Forward Current Characteristics (Typical)**

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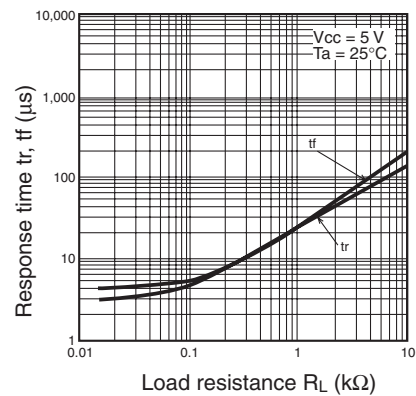

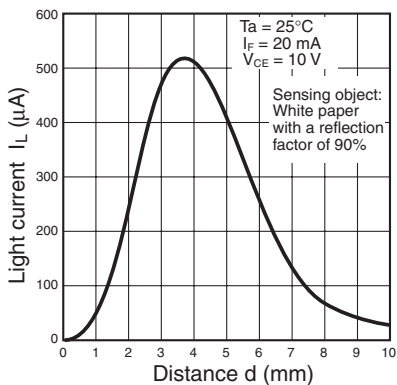**Relative Light Current vs. Ambient Temperature Characteristics (Typical)**

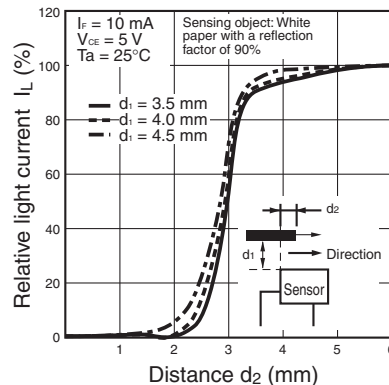**Dark Current vs. Ambient Temperature Characteristics (Typical)**
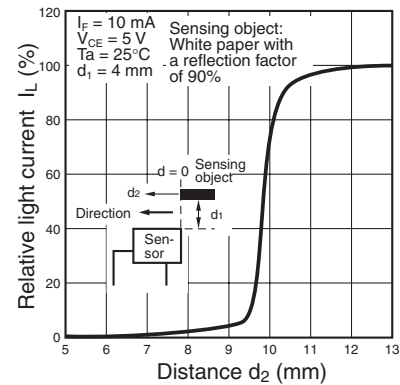

Response Time vs. Load Resistance Characteristics (Typical)
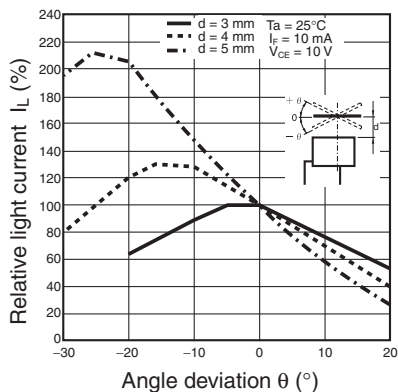

Sensing Distance Characteristics (Typical)

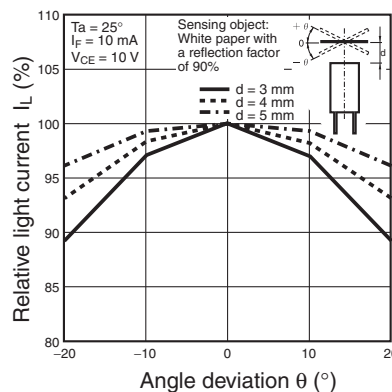
Sensing Position Characteristics (Typical)

Sensing Position Characteristics (Typical)

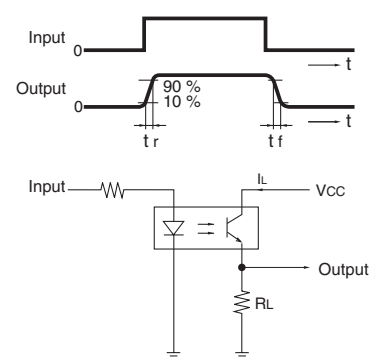**Sensing Angle Characteristics (Typical)**

Sensing Angle Characteristics (Typical)

Response Time Measurement Circuit

EE-SY169B Photomicrosensor (Reflective)   159

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