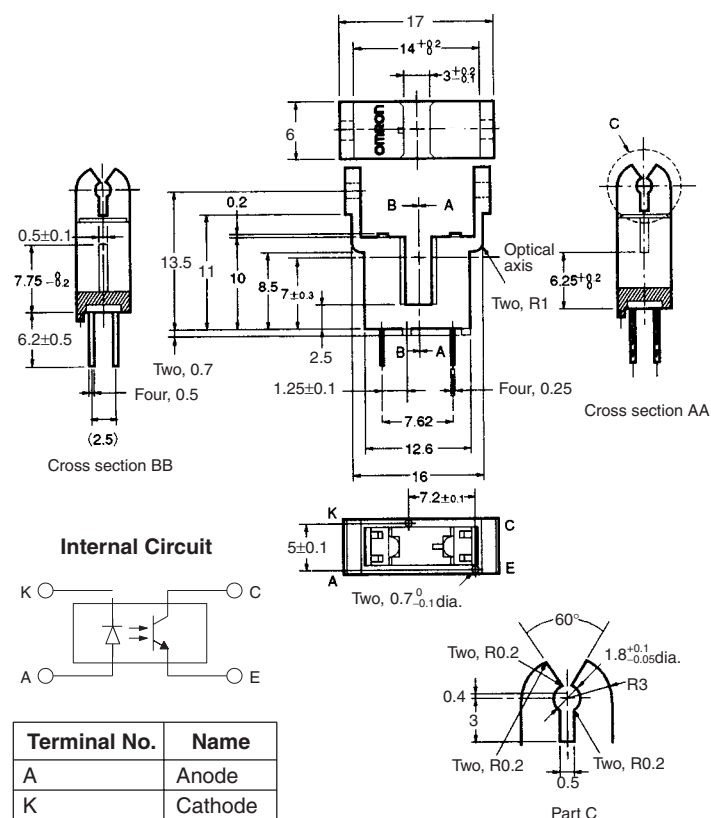


# Photomicrosensor (Actuator Mounted) EE-SA102

 Be sure to read *Precautions* on page 25.

## ■ Dimensions

**Note:** All units are in millimeters unless otherwise indicated.



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

Unless otherwise specified,  
the tolerances are  $\pm 0.2$  mm.

## ■ Features

- An actuator can be attached.
- PCB mounting type.
- High resolution with a 0.5-mm-wide aperture.

### ■ Absolute Maximum Ratings (Ta = 25°C)

| Item                  |                           | Symbol    | Rated value            |
|-----------------------|---------------------------|-----------|------------------------|
| Emitter               | Forward current           | $I_F$     | 50 mA<br>(see note 1)  |
|                       | Pulse forward current     | $I_{FP}$  | 1 A<br>(see note 2)    |
|                       | Reverse voltage           | $V_R$     | 4 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<br>(see note 1) |
| Ambient temperature   | Operating                 | $T_{opr}$ | –25°C to 85°C          |
|                       | Storage                   | $T_{stg}$ | –30°C to 100°C         |
| Soldering temperature |                           | $T_{sol}$ | 260°C<br>(see note 3)  |

**Note: 1.** Refer to the temperature rating chart if the ambient temperature exceeds 25°C.

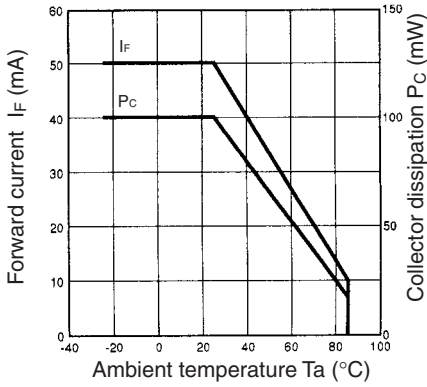
2. The pulse width is 10  $\mu$ s maximum with a frequency of 100 Hz.
3. Complete soldering within 10 seconds.

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

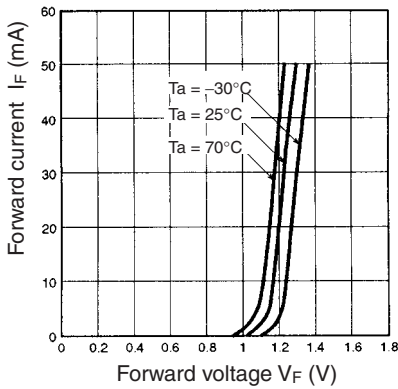
| Item         |                                      | Symbol               | Value                                          | Condition                                                          |
|--------------|--------------------------------------|----------------------|------------------------------------------------|--------------------------------------------------------------------|
| Emitter      | Forward voltage                      | $V_F$                | 1.2 V typ., 1.5 V max.                         | $I_F = 30 \text{ mA}$                                              |
|              | Reverse current                      | $I_R$                | 0.01 $\mu\text{A}$ typ., 10 $\mu\text{A}$ max. | $V_R = 4 \text{ V}$                                                |
|              | Peak emission wavelength             | $\lambda_p$          | 940 nm typ.                                    | $I_F = 20 \text{ mA}$                                              |
| Detector     | Light current                        | $I_L$                | 0.5 mA min., 14 mA max.                        | $I_F = 20 \text{ mA}$ , $V_{CE} = 10 \text{ V}$                    |
|              | Dark current                         | $I_D$                | 2 nA typ., 200 nA max.                         | $V_{CE} = 10 \text{ V}$ , 0 lx                                     |
|              | Leakage current                      | $I_{LEAK}$           | ---                                            | ---                                                                |
|              | Collector–Emitter saturated voltage  | $V_{CE}(\text{sat})$ | 0.1 V typ., 0.4 V max.                         | $I_F = 20 \text{ mA}$ , $I_L = 0.1 \text{ mA}$                     |
|              | Peak spectral sensitivity wavelength | $\lambda_p$          | 850 nm typ.                                    | $V_{CE} = 10 \text{ V}$                                            |
| Rising time  |                                      | $t_r$                | 4 $\mu\text{s}$ typ.                           | $V_{CC} = 5 \text{ V}$ , $R_L = 100 \Omega$ , $I_L = 5 \text{ mA}$ |
| Falling time |                                      | $t_f$                | 4 $\mu\text{s}$ typ.                           | $V_{CC} = 5 \text{ V}$ , $R_L = 100 \Omega$ , $I_L = 5 \text{ mA}$ |

# Engineering Data

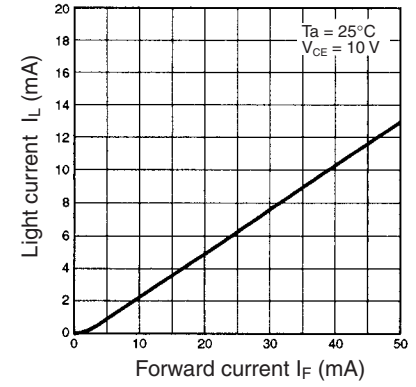
**Forward Current vs. Collector Dissipation Temperature Rating**



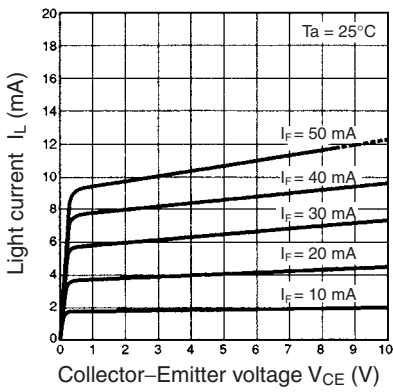
**Forward Current vs. Forward Voltage Characteristics (Typical)**



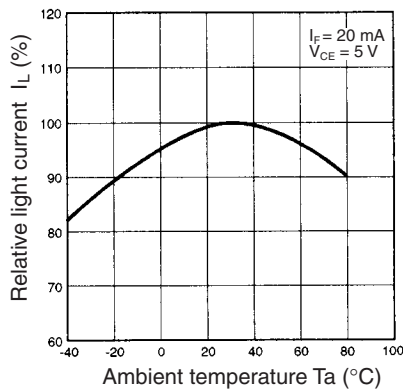
**Light Current vs. Forward Current Characteristics (Typical)**



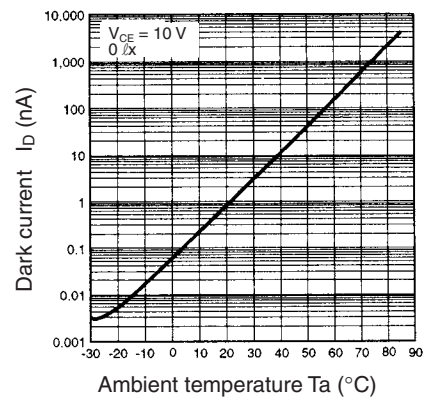
**Light Current vs. Collector-Emitter Voltage Characteristics (Typical)**



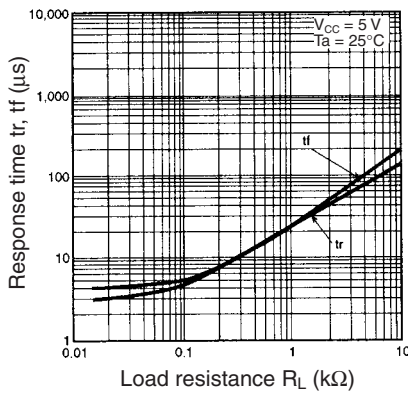
**Relative Light Current vs. Ambient Temperature Characteristics (Typical)**



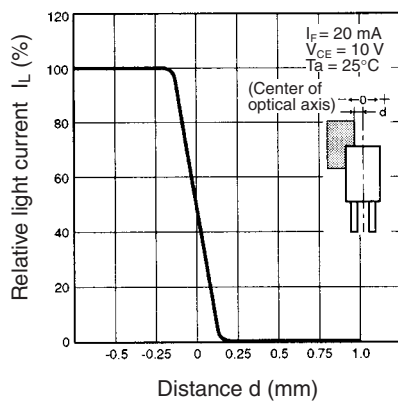
**Dark Current vs. Ambient Temperature Characteristics (Typical)**



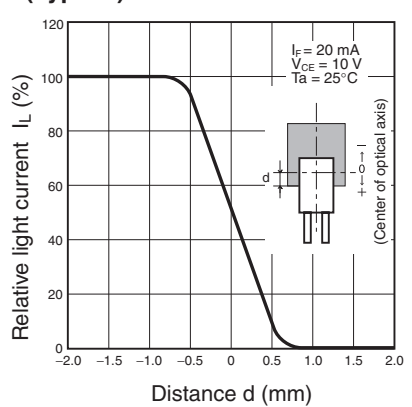
**Response Time vs. Load Resistance Characteristics (Typical)**



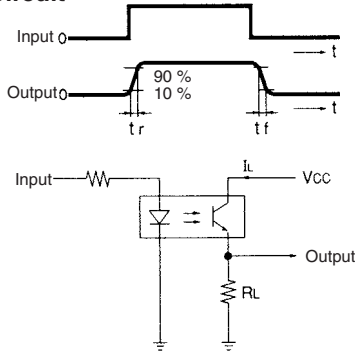
**Sensing Position Characteristics (Typical)**



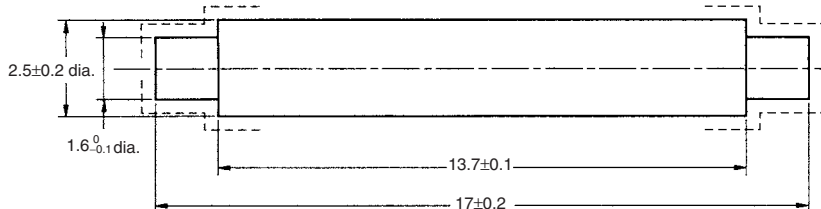
**Sensing Position Characteristics (Typical)**



**Response Time Measurement Circuit**



**Actuator Dimensions**



- Note:**
1. Make sure that the portions marked with dotted lines have no burrs.
  2. The material of the actuator must be selected by considering the infrared permeability of the actuator.