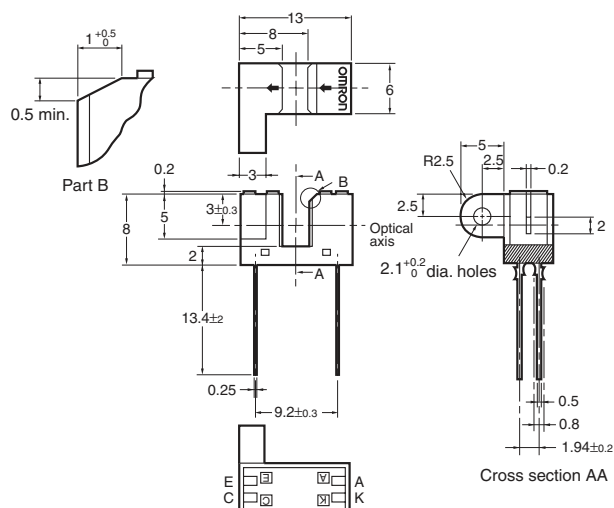


# Photomicrosensor (Transmissive) EE-SX129

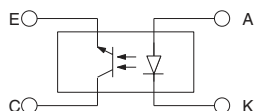
**⚠ Be sure to read *Precautions* on page 25.**

## ■ Dimensions

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



Internal Circuit



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     |

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

## ■ Features

- High-resolution model with a 0.2-mm-wide sensing aperture.
- PCB mounting type.

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

| Item                  | Symbol                    | Rated value                                                             |
|-----------------------|---------------------------|-------------------------------------------------------------------------|
| Emitter               | Forward current           | $I_F$ 50 mA (see note 1)                                                |
|                       | Pulse forward current     | $I_{FP}$ 1 A (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 (see note 1)                                               |
|                       | Ambient temperature       | Operating: $T_{opr}$ -25°C to 85°C<br>Storage: $T_{stg}$ -40°C to 100°C |
| Soldering temperature |                           | $T_{sol}$ 260°C (see note 3)                                            |

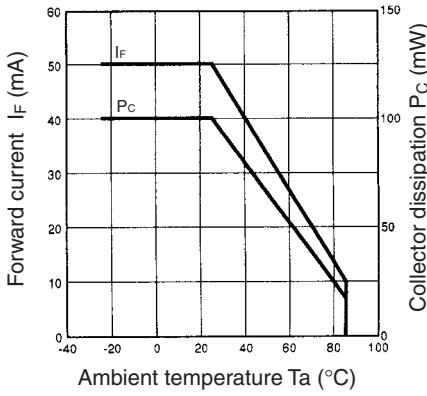
- Note:**
1. Refer to the temperature rating chart if the ambient temperature exceeds 25°C.
  2. The pulse width is 10  $\mu$ s maximum with a frequency of 100 Hz.
  3. Complete soldering within 10 seconds.

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

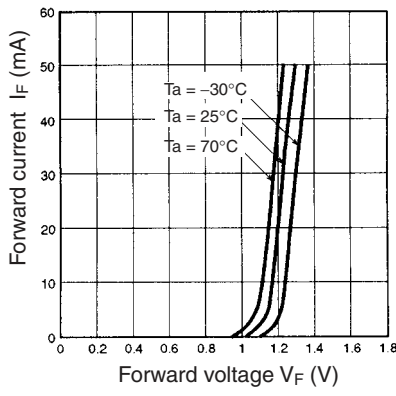
| Item         | Symbol                               | Value                                    | Condition                                         |
|--------------|--------------------------------------|------------------------------------------|---------------------------------------------------|
| Emitter      | Forward voltage                      | $V_F$ 1.2 V typ., 1.5 V max.             | $I_F = 30$ mA                                     |
|              | Reverse current                      | $I_R$ 0.01 $\mu$ A typ., 10 $\mu$ A max. | $V_R = 4$ V                                       |
|              | Peak emission wavelength             | $\lambda_P$ 920 nm typ.                  | $I_F = 20$ mA                                     |
| Detector     | Light current                        | $I_L$ 0.2 mA min.                        | $I_F = 20$ mA, $V_{CE} = 10$ V                    |
|              | Dark current                         | $I_D$ 2 nA typ., 200 nA max.             | $V_{CE} = 10$ V, 0 lx                             |
|              | Leakage current                      | $I_{LEAK}$ ---                           | ---                                               |
|              | Collector–Emitter saturated voltage  | $V_{CE (sat)}$ ---                       | ---                                               |
|              | Peak spectral sensitivity wavelength | $\lambda_P$ 850 nm typ.                  | $V_{CE} = 10$ V                                   |
| Rising time  | $t_r$                                | 4 $\mu$ s typ.                           | $V_{CC} = 5$ V, $R_L = 100 \Omega$ , $I_L = 5$ mA |
| Falling time | $t_f$                                | 4 $\mu$ s typ.                           | $V_{CC} = 5$ V, $R_L = 100 \Omega$ , $I_L = 5$ mA |

# ■ Engineering Data

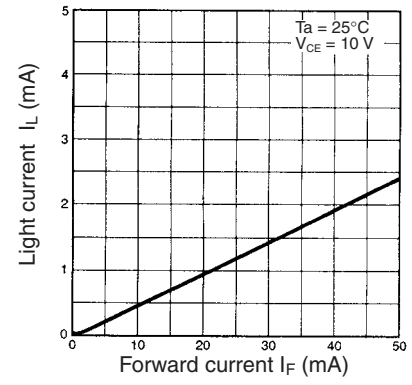
**Forward Current vs. Collector Dissipation Temperature Rating**



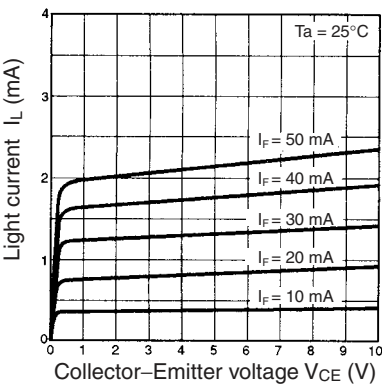
**Forward Current vs. Forward Voltage Characteristics (Typical)**



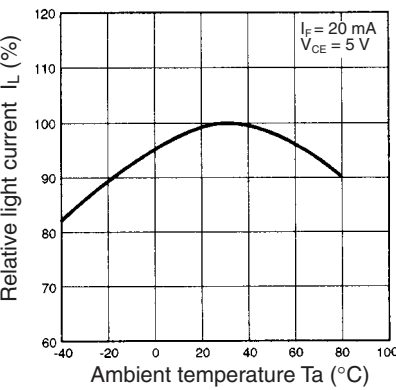
**Light Current vs. Forward Current Characteristics (Typical)**



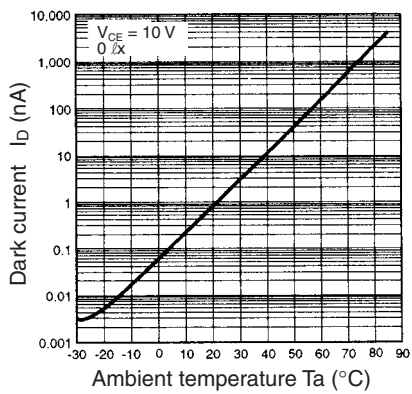
**Light Current vs. Collector-Emitter Voltage Characteristics (Typical)**



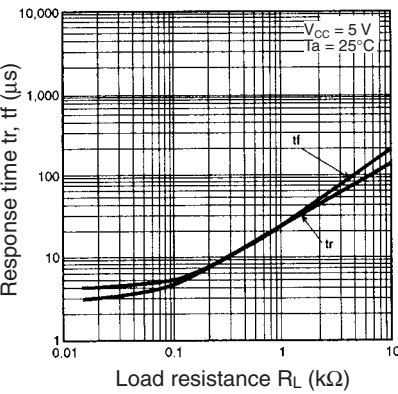
**Relative Light Current vs. Ambient Temperature Characteristics (Typical)**



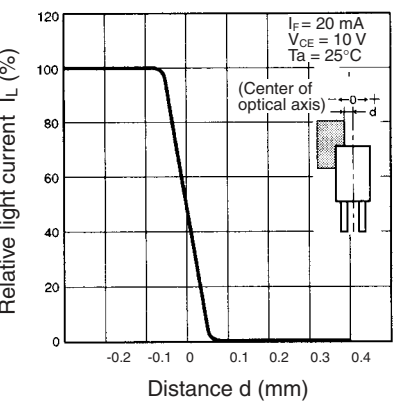
**Dark Current vs. Ambient Temperature Characteristics (Typical)**



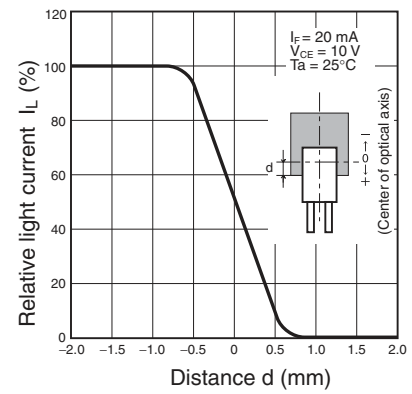
**Response Time vs. Load Resistance Characteristics (Typical)**



**Sensing Position Characteristics (Typical)**



**Sensing Position Characteristics (Typical)**



**Response Time Measurement Circuit**

