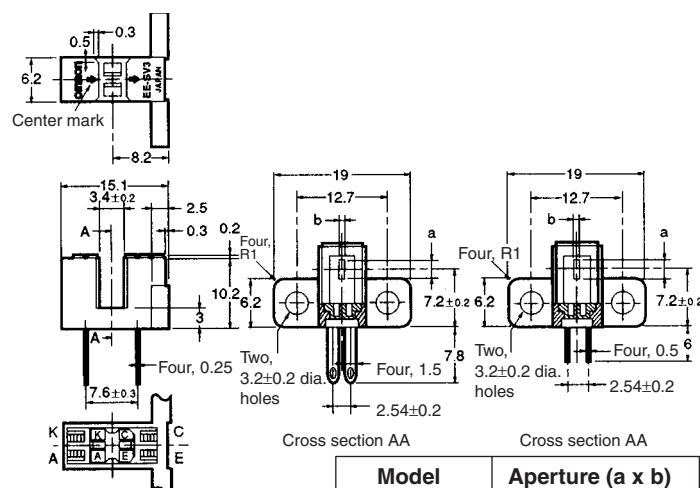


# Photomicrosensor (Transmissive) EE-SV3 Series

 Be sure to read *Precautions* on page 25.

## ■ Dimensions

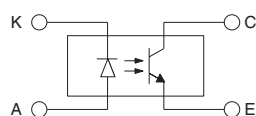
**Note:** All units are in millimeters unless otherwise indicated.



Cross section AA                      Cross section AA

| Model       | Aperture (a x b) |
|-------------|------------------|
| EE-SV3-(B)  | 2.1 x 0.5        |
| EE-SV3-C(S) | 2.1 x 1.0        |
| EE-SV3-D(S) | 2.1 x 0.2        |
| EE-SV3-G(S) | 0.5 x 2.1        |

### 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.    | ±0.2      |
| 3 < mm ≤ 6   | ±0.24     |
| 6 < mm ≤ 10  | ±0.29     |
| 10 < mm ≤ 18 | ±0.35     |
| 18 < mm ≤ 30 | ±0.42     |

## ■ Features

- High-resolution model with a 0.2-mm-wide or 0.5-mm-wide sensing aperture, high-sensitivity model with a 1-mm-wide sensing aperture, and model with a horizontal sensing aperture are available.
- Solder terminal models:  
EE-SV3/-SV3-CS/-SV3-DS/-SV3-GS
- PCB terminal models  
EE-SV3-B/-SV3-C/-SV3-D/-SV3-G

### ■ 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.

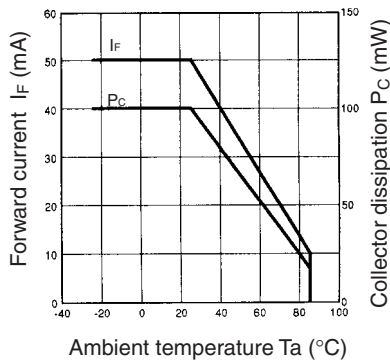
2. The pulse width is 10  $\mu$ s maximum with a frequency of 100 Hz.
3. Complete soldering within 10 seconds.

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

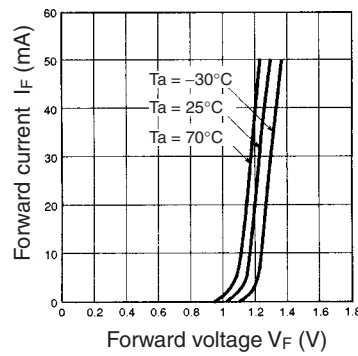
| Item         |                                      | Symbol                | Value                    |             |             |                           | Condition                                          |
|--------------|--------------------------------------|-----------------------|--------------------------|-------------|-------------|---------------------------|----------------------------------------------------|
|              |                                      |                       | EE-SV3(-B)               | EE-SV3-C(S) | EE-SV3-D(S) | EE-SV3-G(S)               |                                                    |
| Emitter      | Forward voltage                      | V <sub>F</sub>        | 1.2 V typ., 1.5 V max.   |             |             |                           | I <sub>F</sub> = 30 mA                             |
|              | Reverse current                      | I <sub>R</sub>        | 0.01 μA typ., 10 μA max. |             |             |                           | V <sub>R</sub> = 4 V                               |
|              | Peak emission wave-length            | λ <sub>P</sub>        | 940 nm typ.              |             |             |                           | I <sub>F</sub> = 20 mA                             |
| Detector     | Light current                        | I <sub>L</sub>        | 0.5 to 14 mA             | 1 to 28 mA  | 0.1 mA min. | 0.5 to 14 mA              | I <sub>F</sub> = 20 mA,<br>V <sub>CE</sub> = 10 V  |
|              | Dark current                         | I <sub>D</sub>        | 2 nA typ., 200 nA max.   |             |             |                           | V <sub>CE</sub> = 10 V,<br>0 lx                    |
|              | Leakage current                      | I <sub>LEAK</sub>     | ---                      |             |             |                           | ---                                                |
|              | Collector–Emitter saturated voltage  | V <sub>CE</sub> (sat) | 0.1 V typ., 0.4 V max.   |             | ---         | 0.1 V typ.,<br>0.4 V max. | I <sub>F</sub> = 20 mA,<br>I <sub>L</sub> = 0.1 mA |
|              | Peak spectral sensitivity wavelength | λ <sub>P</sub>        | 850 nm typ.              |             |             |                           | V <sub>CE</sub> = 10 V                             |
| Rising time  |                                      | tr                    | 4 μs typ.                |             |             |                           | V <sub>CC</sub> = 5 V,                             |
| Falling time |                                      | tf                    | 4 μs typ.                |             |             |                           | R <sub>L</sub> = 100 Ω,<br>I <sub>L</sub> = 5 mA   |

# Engineering Data

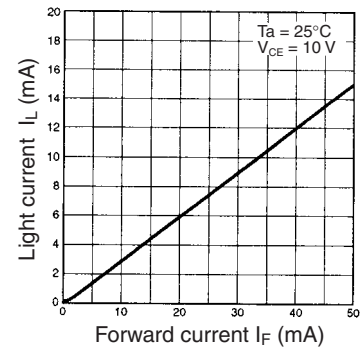
**Forward Current vs. Collector Dissipation Temperature Rating**



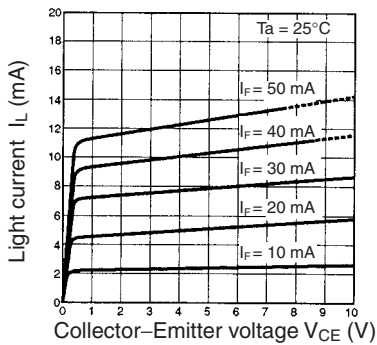
**Forward Current vs. Forward Voltage Characteristics (Typical)**



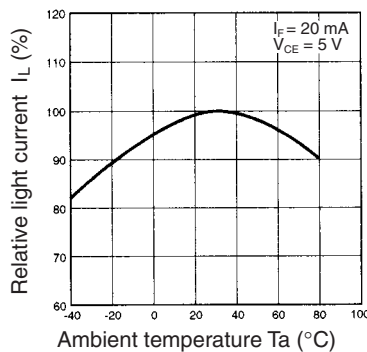
**Light Current vs. Forward Current Characteristics (Typical)**



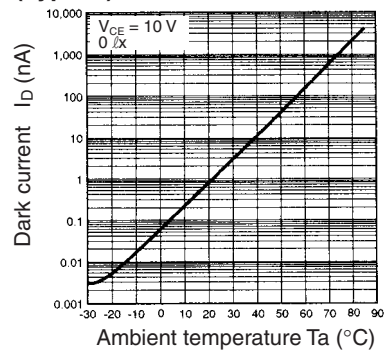
**Light Current vs. Collector-Emitter Voltage Characteristics (EE-SV3(-B))**



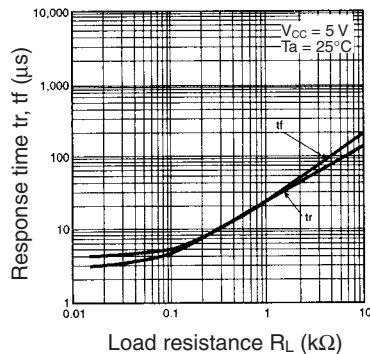
**Relative Light Current vs. Ambient Temperature Characteristics (Typical)**



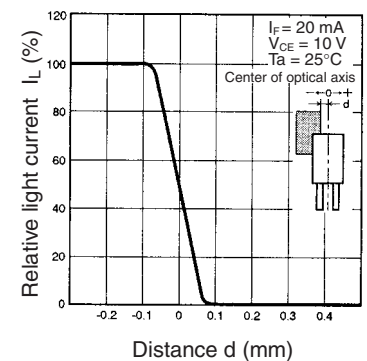
**Dark Current vs. Ambient Temperature Characteristics (Typical)**



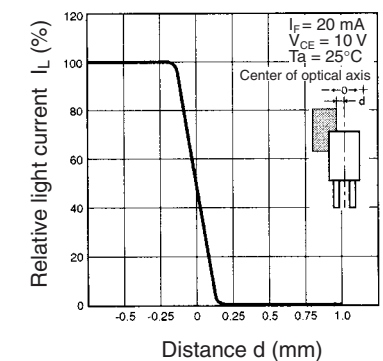
**Response Time vs. Load Resistance Characteristics (Typical)**



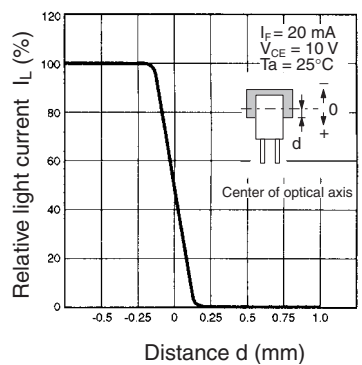
**Sensing Position Characteristics (EE-SV3-D(S))**



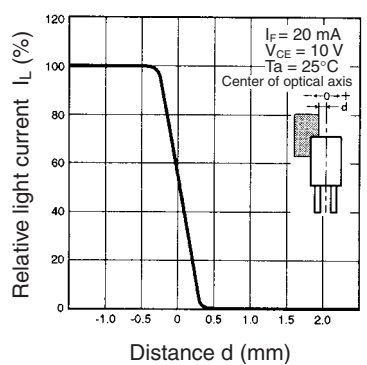
**Sensing Position Characteristics (EE-SV3(-B))**



**Sensing Position Characteristics (EE-SV3-G(S))**



**Sensing Position Characteristics (EE-SV3-C(S))**



**Response Time Measurement Circuit**

