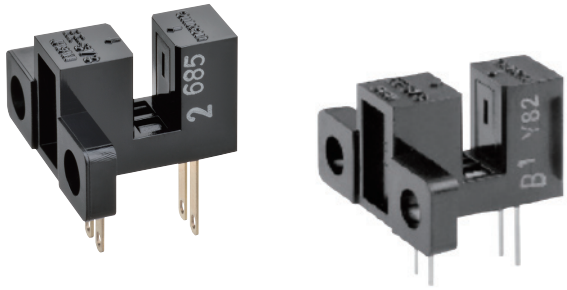
# Photomicrosensor (Transmissive)

# EE-SV3 Series

## Slot/Terminal Type with Screw Mounted Tab (Slot Width: 3.4 mm)

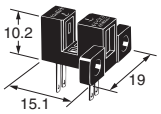
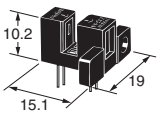
- Four aperture types
- Two types of terminals (terminal for cord soldering, terminal for PCB mounting)

**Be sure to read *Safety Precautions* on Page 3.**



## Ordering Information

### Photomicrosensor

| Appearance | Sensing method | Connecting method | Sensing distance | Aperture size (H × W) (mm) (Both emitting side and detecting side) | Output type | Model | Minimum packing unit (Unit: pcs) |
|---|---|---|---|---|---|---|---|
|   | Transmissive (slot type) | Terminal for cord soldering | 3.4 mm (Slot width) | 2.1 × 0.5 | Phototransistor | EE-SV3 | 1 |
| | | | | 2.1 × 1 | | EE-SV3-CS | |
| | | | | 2.1 × 0.2 | | EE-SV3-DS | |
| | | | | 0.5 × 2.1 | | EE-SV3-GS | |
|   | | Terminal for PCB mounting | | 2.1 × 0.5 | | EE-SV3-B | |
| | | | | 2.1 × 1 | | EE-SV3-C | |
| | | | | 2.1 × 0.2 | | EE-SV3-D | |
| | | | | 0.5 × 2.1 | | EE-SV3-G | |

**Note:** Order in multiples of minimum packing unit.

## Ratings, Characteristics and Exterior Specifications

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

| Item | | Symbol | Rated value | Unit |
|---|---|---|---|---|
| **Emitter** | | | | |
| | **Forward current** | $I_F$ | 50*1 | mA |
| | **Pulse forward current** | $I_{FP}$ | 1*2 | A |
| | **Reverse voltage** | $V_R$ | 4 | V |
| **Detector** | | | | |
| | **Collector-Emitter voltage** | $V_{CEO}$ | 30 | V |
| | **Emitter-Collector voltage** | $V_{ECO}$ | — | V |
| | **Collector current** | $I_C$ | 20 | mA |
| | **Collector dissipation** | $P_C$ | 100*1 | mW |
| **Operating temperature** | | $T_{opr}$ | -25 to 85 | °C |
| **Storage temperature** | | $T_{stg}$ | -30 to 100 | °C |
| **Soldering temperature** | | $T_{sol}$ | 260*3 | °C |

*1. Refer to the temperature rating chart if the ambient temperature exceeds 25°C.
*2. Pulse width ≤ 10 µs, Repeated 100 Hz
*3. Complete soldering within 10 seconds.

### Exterior Specifications

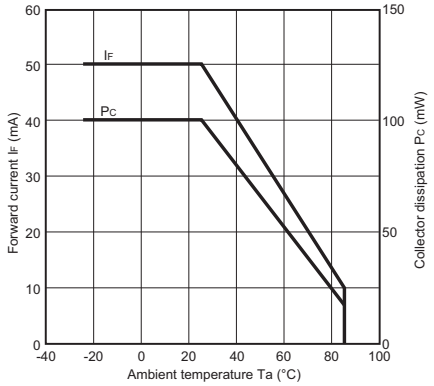
| Connecting method | Model | Weight (g) | Material | |
|---|---|---|---|---|
| | | | Case | Bottom plate |
| Terminal for cord soldering | EE-SV3 | 1 | Polycarbonate | Polycarbonate |
| | EE-SV3-CS | | | |
| | EE-SV3-DS | | | |
| | EE-SV3-GS | | | |
| Terminal for PCB mounting | EE-SV3-B | | | |
| | EE-SV3-C | | | |
| | EE-SV3-D | | | |
| | EE-SV3-G | | | |

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

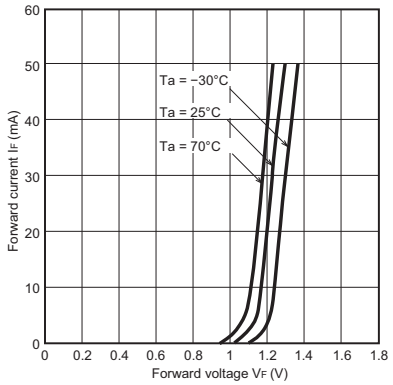
| Item | | Symbol | Value | | | | Unit | Condition |
|---|---|---|---|---|---|---|---|---|
| | | | EE-SV3 EE-SV3-B | EE-SV3-C EE-SV3-CS | EE-SV3-D EE-SV3-DS | EE-SV3-G EE-SV3-GS | | |
| **Emitter** | | | | | | | | |
| | **Forward voltage** | $V_F$ | 1.2 (TYP.) 1.5 (MAX.) | | | | V | $I_F$ = 30 mA |
| | **Reverse current** | $I_R$ | 0.01 (TYP.) 10 (MAX.) | | | | µA | $V_R$ = 4 V |
| | **Peak emission wavelength** | $\lambda_P$ | 940 (TYP.) | | | | nm | $I_F$ = 20 mA |
| **Detector** | | | | | | | | |
| | **Light current** | $I_L$ | 0.5 to 14 | 1 to 28 | 0.1 (MIN.) | 0.5 to 14 | mA | $I_F$ = 20 mA, $V_{CE}$ = 10 V |
| | **Dark current** | $I_D$ | 2 (TYP.) 200 (MAX.) | | | | nA | $V_{CE}$ = 10 V, 0 lx |
| | **Leakage current** | $I_{LEAK}$ | — | | | | µA | — |
| | **Collector-Emitter saturated voltage** | $V_{CE}$ (sat) | 0.1 (TYP.) 0.4 (MAX.) | | — | 0.1 (TYP.) 0.4 (MAX.) | V | $I_F$ = 20 mA, $I_L$ = 0.1 mA |
| | **Peak spectral sensitivity wavelength** | $\lambda_P$ | 850 (TYP.) | | | | nm | $V_{CE}$ = 10 V |
| **Rising time** | | tr | 4 (TYP.) | | | | µs | $V_{CC}$ = 5 V, $R_L$ = 100 Ω $I_L$ = 5 mA |
| **Falling time** | | tf | 4 (TYP.) | | | | µs | |

# Engineering Data (Reference Value)

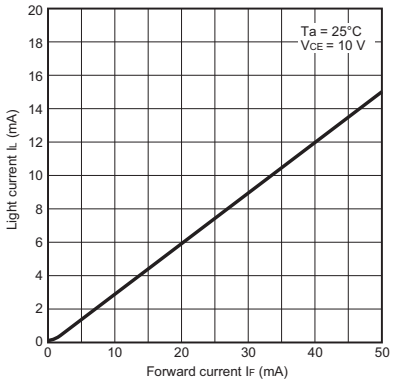
### Fig 1. Forward Current vs. Collector Dissipation Temperature Rating



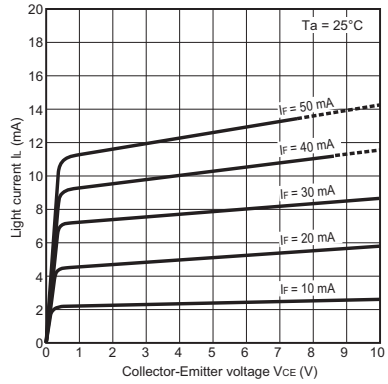

### Fig 2. Forward Current vs. Forward Voltage Characteristics (Typical)



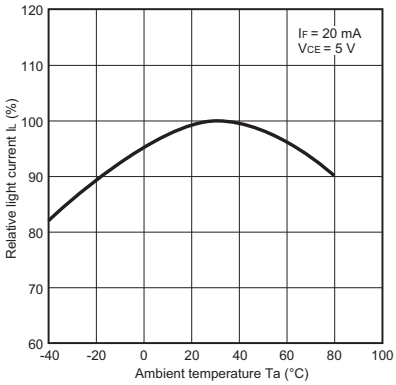

### Fig 3. Light Current vs. Forward Current Characteristics (Typical) EE-SV3(-B)



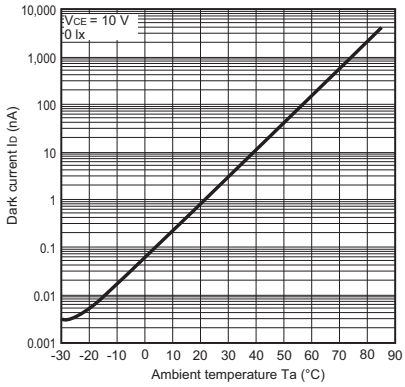

### Fig 4. Light Current vs. Collector-Emitter Voltage Characteristics (Typical) EE-SV3(-B)



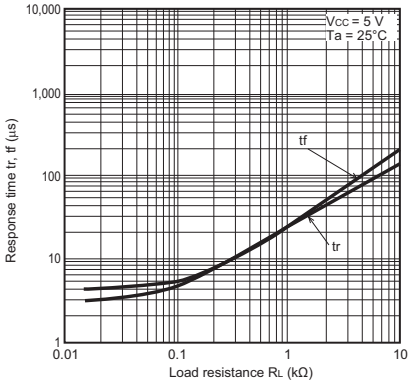

### Fig 5. Relative Light Current vs. Ambient Temperature Characteristics (Typical)



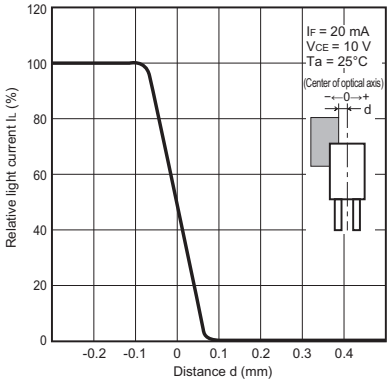

### Fig 6. Dark Current vs. Ambient Temperature Characteristics (Typical)



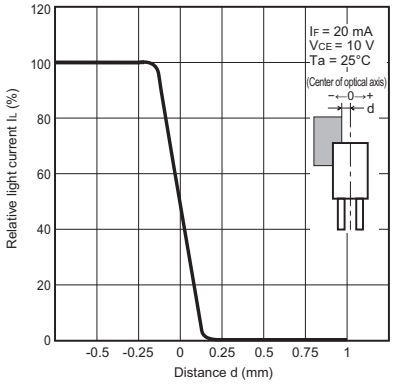

### Fig 7. Response Time vs. Load Resistance Characteristics (Typical)



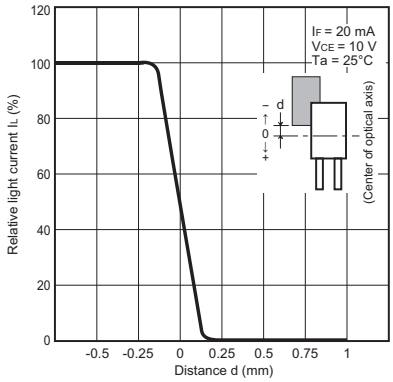

### Fig 8. Sensing Position Characteristics (Typical) EE-SV3-D(S)



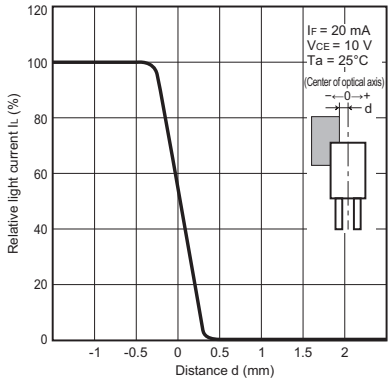

### Fig 9. Sensing Position Characteristics (Typical) EE-SV3(-B)



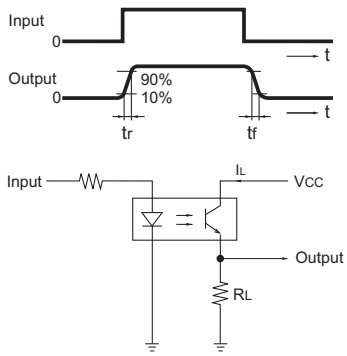

### Fig 10. Sensing Position Characteristics (Typical) EE-SV3-G(S)




### Fig 11. Sensing Position Characteristics (Typical) EE-SV3-C(S)




### Fig 12. Response Time Measurement Circuit



# Safety Precautions

**To ensure safe operation, be sure to read and follow the Instruction Manual provided with the Sensor.**

### ⚠ CAUTION

**This product is not designed or rated for ensuring safety of persons either directly or indirectly.**
**Do not use it for such purposes.**

### Precautions for Correct Use

Do not use the product in atmospheres or environments that exceed product ratings.

### Precautions for Safe Use

**Do not use the product with a voltage or current that exceeds the rated range.**

Applying a voltage or current that is higher than the rated range may result in explosion or fire.

**Do not miswire such as the polarity of the power supply voltage.**

Otherwise the product may be damaged or it may burn.

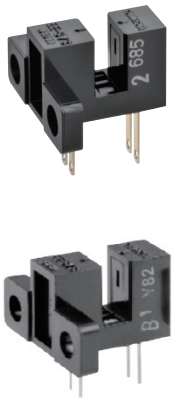
**This product does not resist water. Do not use the product in places where water or oil may be sprayed onto the product.**

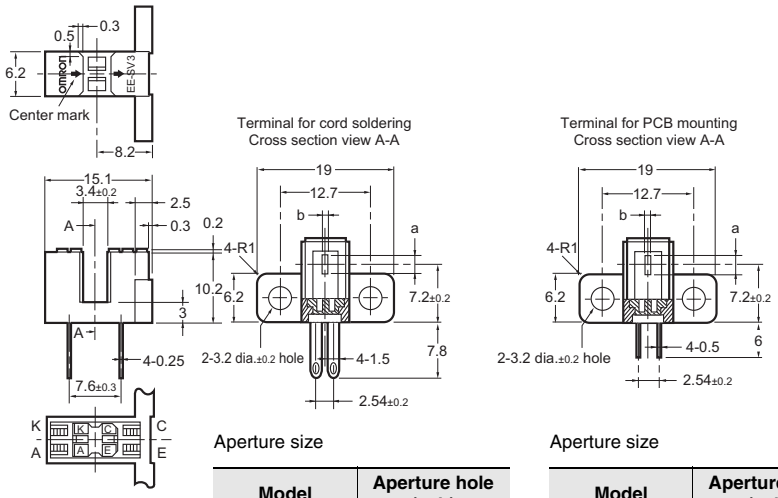
# Dimensions and Internal Circuit

**(Unit: mm)**

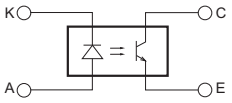
## Photomicrosensor

### EE-SV3 Series






Internal circuit




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

Aperture size

| Model | Aperture hole (a×b) |
|---|---|
| EE-SV3 | 2.1 × 0.5 |
| EE-SV3-CS | 2.1 × 1 |
| EE-SV3-DS | 2.1 × 0.2 |
| EE-SV3-GS | 0.5 × 2.1 |

Aperture size

| Model | Aperture hole (a×b) |
|---|---|
| EE-SV3-B | 2.1 × 0.5 |
| EE-SV3-C | 2.1 × 1 |
| EE-SV3-D | 2.1 × 0.2 |
| EE-SV3-G | 0.5 × 2.1 |

Unless otherwise specified, the tolerances are as shown below.

| 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 |

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