

# Photomicrosensor (Transmissive)

# EE-SH3 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)

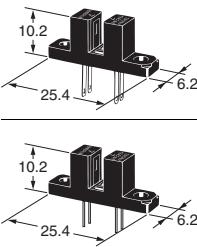
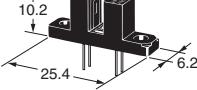
 Be sure to read *Safety Precautions* on Page 3.

RoHS Compliant



## 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-SH3	1	
				2.1 × 1		EE-SH3-CS		
				2.1 × 0.2		EE-SH3-DS		
				0.5 × 2.1		EE-SH3-GS		
		Terminal for PCB mounting		2.1 × 0.5		EE-SH3-B		
				2.1 × 1		EE-SH3-C		
				2.1 × 0.2		EE-SH3-D		
				0.5 × 2.1		EE-SH3-G		

Note: Order in multiples of minimum packing unit.

## Ratings, Characteristics and Exterior Specifications

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

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

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

\*2. Pulse width  $\leq 10 \mu\text{s}$ , Repeated 100 Hz

\*3. Complete soldering within 10 seconds.

### Exterior Specifications

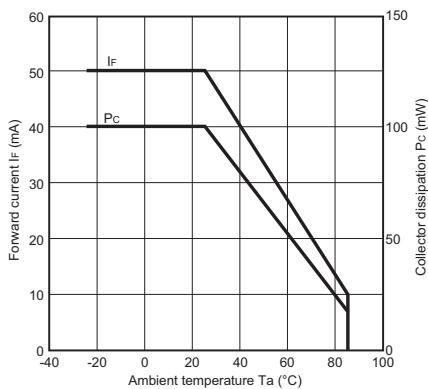
Connecting method	Model	Weight (g)	Material	
			Case	Bottom plate
Terminal for cord soldering	EE-SH3	0.9	Polycarbonate	Polycarbonate
	EE-SH3-CS			
	EE-SH3-DS			
	EE-SH3-GS			
Terminal for PCB mounting	EE-SH3-B			
	EE-SH3-C			
	EE-SH3-D			
	EE-SH3-G			

### Electrical and Optical Characteristics ( $T_a = 25^\circ\text{C}$ )

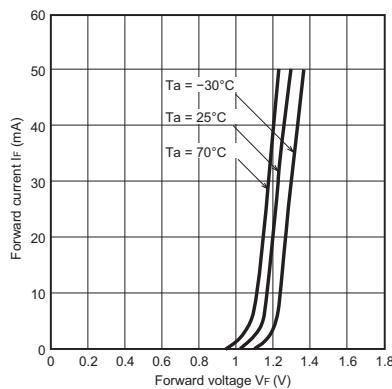
Item	Symbol	Value					Unit	Condition
		EE-SH3	EE-SH3-C	EE-SH3-D	EE-SH3-G	EE-SH3-GS		
Emitter								
Forward voltage	$V_F$	1.2 (TYP.) 1.5 (MAX.)					V	$I_F = 30 \text{ mA}$
Reverse current	$I_R$	0.01 (TYP.) 10 (MAX.)					$\mu\text{A}$	$V_R = 4 \text{ V}$
Peak emission wavelength	$\lambda_P$	940 (TYP.)					nm	$I_F = 20 \text{ mA}$
Detector								
Light current	$I_L$	0.5 to 14	1 to 28	0.1 (MIN.)	0.5 to 14	mA	$I_F = 20 \text{ mA}$ , $V_{CE} = 10 \text{ V}$	
Dark current	$I_D$	2 (TYP.) 200 (MAX.)				nA	$V_{CE} = 10 \text{ V}$ , 0 lx	
Leakage current	$I_{LEAK}$	—				$\mu\text{A}$	—	
Collector-Emitter saturated voltage	$V_{CE} (\text{sat})$	0.1 (TYP.) 0.4 (MAX.)	—	0.1 (TYP.) 0.4 (MAX.)	—	V	$I_F = 20 \text{ mA}$ , $I_L = 0.1 \text{ mA}$	
Peak spectral sensitivity wavelength	$\lambda_P$	850 (TYP.)				nm	$V_{CE} = 10 \text{ V}$	
Rising time	$t_r$	4 (TYP.)				$\mu\text{s}$	$V_{CC} = 5 \text{ V}$ , $R_L = 100 \Omega$	
Falling time	$t_f$	4 (TYP.)				$\mu\text{s}$	$I_L = 5 \text{ mA}$	

# Engineering Data (Reference Value)

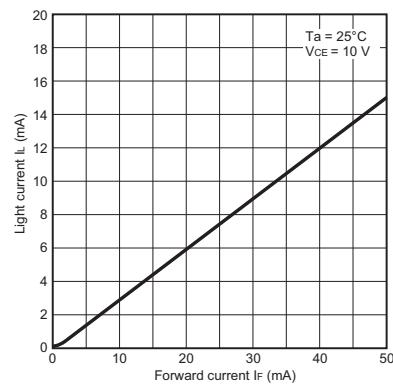
**Fig 1. Forward Current vs. Collector Dissipation Temperature Rating**



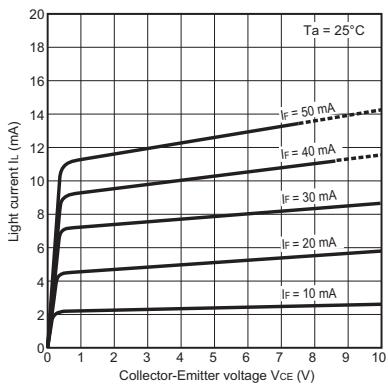
**Fig 2. Forward Current vs. Forward Voltage Characteristics (Typical)**



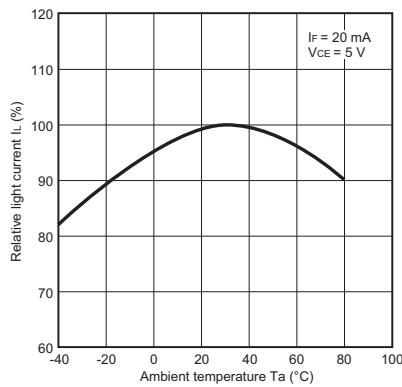
**Fig 3. Light Current vs. Forward Current Characteristics (Typical)**



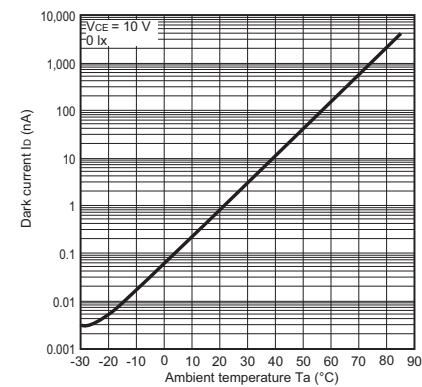
**Fig 4. Light Current vs. Collector-Emitter Voltage Characteristics (Typical) EE-SH3(-B)**



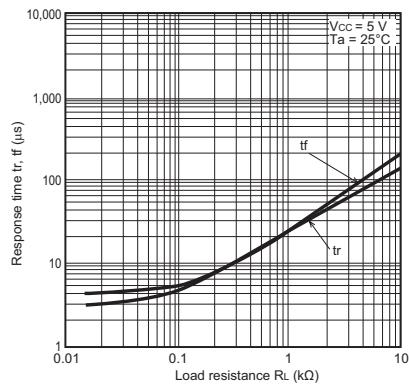
**Fig 5. Relative Light Current vs. Ambient Temperature Characteristics (Typical)**



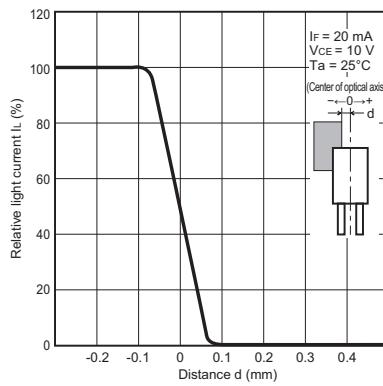
**Fig 6. Dark Current vs. Ambient Temperature Characteristics (Typical)**



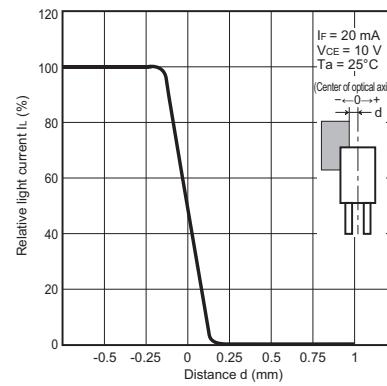
**Fig 7. Response Time vs. Load Resistance Characteristics (Typical)**



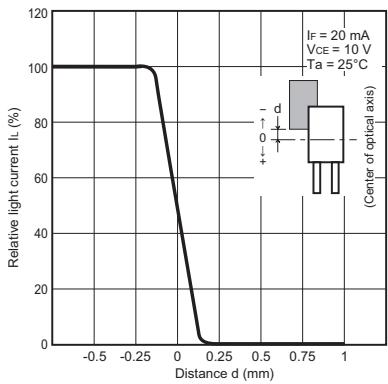
**Fig 8. Sensing Position Characteristics (Typical) EE-SH3-D(S)**



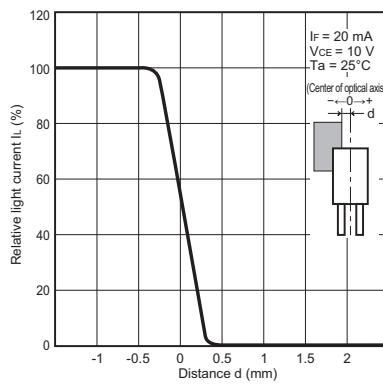
**Fig 9. Sensing Position Characteristics (Typical) EE-SH3-B**



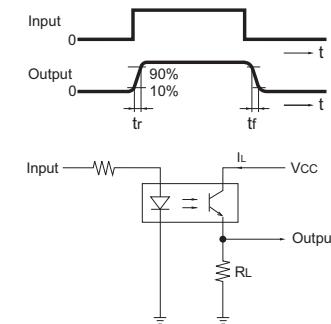
**Fig 10. Sensing Position Characteristics (Typical) EE-SH3-G(S)**



**Fig 11. Sensing Position Characteristics (Typical) EE-SH3-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.

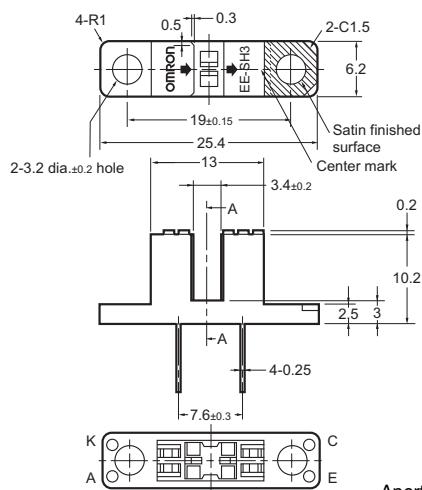
**This product does not resist water. Do not use the product in places where water or oil may be sprayed onto the product.**

## Dimensions and Internal Circuit

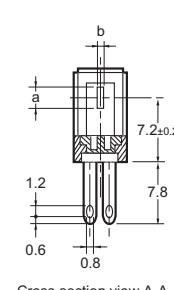
(Unit: mm)

### Photomicrosensor

#### EE-SH3 Series

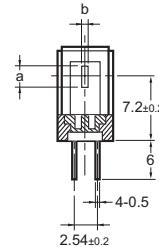


Terminal for cord soldering  
Cross section view A-A



Cross section view A-A

Terminal for PCB mounting  
Cross section view A-A



Cross section view A-A

#### Aperture size

Model	Aperture hole (axb)
EE-SH3	2.1 × 0.5
EE-SH3-CS	2.1 × 1
EE-SH3-DS	2.1 × 0.2
EE-SH3-GS	0.5 × 2.1

#### Aperture size

Model	Aperture hole (axb)
EE-SH3-B	2.1 × 0.5
EE-SH3-C	2.1 × 1
EE-SH3-D	2.1 × 0.2
EE-SH3-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

Please check each region's Terms & Conditions by region website.

---

## **OMRON Corporation**

**Electronic and Mechanical Components Company**

### **Regional Contact**

#### **Americas**

<https://www.components.omron.com/>

#### **Asia-Pacific**

<https://ecb.omron.com.sg/>

#### **Korea**

<https://www.omron-ecb.co.kr/>

#### **Europe**

<http://components.omron.eu/>

#### **China**

<https://www.ecb.omron.com.cn/>

#### **Japan**

<https://www.omron.co.jp/ecb/>