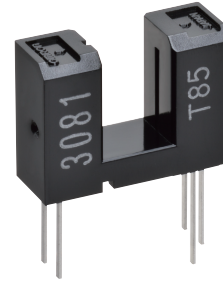


## Slot/Terminal Type (Slot Width: 5 mm)

- Photo IC output (Two types available: Dark-ON (EE-SX3081)/ Light ON (EE-SX4081))
- For use with power supply voltage of 4.5 to 16 VDC
- Directly connectable to C-MOS



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

## Ordering Information

### Photomicrosensor

| Appearance | Sensing method           | Connecting method         | Sensing distance  | Aperture size (H × W) (mm)                       | Output type | Model                                       | Minimum packing unit (Unit: pcs) |
|------------|--------------------------|---------------------------|-------------------|--------------------------------------------------|-------------|---------------------------------------------|----------------------------------|
|            | Transmissive (slot type) | Terminal for PCB mounting | 5 mm (Slot width) | Both emitting side and detecting side<br>2 × 0.5 | Photo IC    | EE-SX3081 (Dark-ON)<br>EE-SX4081 (Light-ON) | 1                                |

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

## Ratings, Characteristics and Exterior Specifications

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

| Item                           | Symbol           | Rated value | Unit |
|--------------------------------|------------------|-------------|------|
| <b>Emitter</b>                 |                  |             |      |
| Forward current                | I <sub>F</sub>   | 50*1        | mA   |
| Reverse voltage                | V <sub>R</sub>   | 4           | V    |
| <b>Detector</b>                |                  |             |      |
| Power supply voltage           | V <sub>CC</sub>  | 16          | V    |
| Output voltage                 | V <sub>OUT</sub> | 28          | V    |
| Output current                 | I <sub>OUT</sub> | 16          | mA   |
| Permissible output dissipation | P <sub>OUT</sub> | 250*1       | mW   |
| Operating temperature          | T <sub>opr</sub> | -40 to 75   | °C   |
| Storage temperature            | T <sub>stg</sub> | -40 to 85   | °C   |
| Soldering temperature          | T <sub>sol</sub> | 260*2       | °C   |

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

\*2. Complete soldering within 10 seconds.

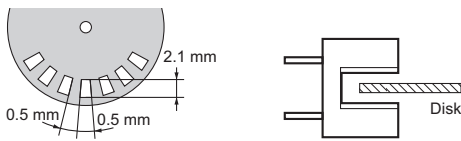
### Exterior Specifications

| Connecting method         | Weight (g) | Material      |
|---------------------------|------------|---------------|
|                           |            | Case          |
| Terminal for PCB mounting | 0.5        | Polycarbonate |

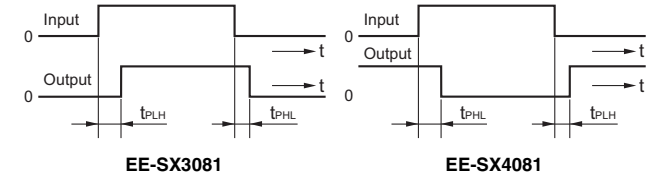
### Electrical and Optical Characteristics (Ta = 25°C)

| Item                                    | Sym-<br>bol                          | Value                                   |      |      | Unit | Condition |                                                                                                                                     |
|-----------------------------------------|--------------------------------------|-----------------------------------------|------|------|------|-----------|-------------------------------------------------------------------------------------------------------------------------------------|
|                                         |                                      | MIN.                                    | TYP. | MAX. |      |           |                                                                                                                                     |
| Emitter                                 |                                      |                                         |      |      |      |           |                                                                                                                                     |
|                                         | Forward voltage                      | V <sub>F</sub>                          | —    | 1.2  | 1.5  | V         | I <sub>F</sub> = 20 mA                                                                                                              |
|                                         | Reverse current                      | I <sub>R</sub>                          | —    | 0.01 | 10   | μA        | V <sub>R</sub> = 4 V                                                                                                                |
|                                         | Peak emission wavelength             | λ <sub>P</sub>                          | —    | 940  | —    | nm        | I <sub>F</sub> = 20 mA                                                                                                              |
| Detector                                |                                      |                                         |      |      |      |           |                                                                                                                                     |
|                                         | Low-level output voltage             | V <sub>OL</sub>                         | —    | 0.12 | 0.4  | V         | V <sub>CC</sub> = 4.5 to 16 V,<br>I <sub>OL</sub> = 16 mA<br>I <sub>F</sub> = 0 mA (EE-SX3081)<br>I <sub>F</sub> = 8 mA (EE-SX4081) |
|                                         | High-level output voltage            | V <sub>OH</sub>                         | 15   | —    | —    | V         | V <sub>CC</sub> = 16 V,<br>R <sub>L</sub> = 1 kΩ<br>I <sub>F</sub> = 8 mA (EE-SX3081)<br>I <sub>F</sub> = 0 mA (EE-SX4081)          |
|                                         | Current consumption                  | I <sub>CC</sub>                         | —    | 3.2  | 10   | mA        | V <sub>CC</sub> = 16 V                                                                                                              |
|                                         | Peak spectral sensitivity wavelength | λ <sub>P</sub>                          | —    | 870  | —    | nm        | V <sub>CC</sub> = 4.5 to 16 V                                                                                                       |
| LED current when output OFF (EE-SX3081) |                                      | I <sub>FT</sub>                         | —    | —    | 8    | mA        | V <sub>CC</sub> = 4.5 to 16 V                                                                                                       |
| LED current when output ON (EE-SX4081)  |                                      |                                         |      |      |      |           |                                                                                                                                     |
| Hysteresis                              |                                      | ΔH                                      | —    | 15   | —    | %         | V <sub>CC</sub> = 4.5 to 16 V* <sup>1</sup>                                                                                         |
| Response frequency                      |                                      | f                                       | 3    | —    | —    | kHz       | V <sub>CC</sub> = 4.5 to 16 V* <sup>2</sup><br>I <sub>F</sub> = 20 mA,<br>I <sub>OL</sub> = 16 mA                                   |
| Response delay time                     |                                      | t <sub>PLH</sub><br>(t <sub>PHL</sub> ) | —    | 3    | —    | μs        | V <sub>CC</sub> = 4.5 to 16 V* <sup>3</sup><br>I <sub>F</sub> = 20 mA,<br>I <sub>OL</sub> = 16 mA                                   |
| Response delay time                     |                                      | t <sub>PHL</sub><br>(t <sub>PLH</sub> ) | —    | 20   | —    | μs        | V <sub>CC</sub> = 4.5 to 16 V* <sup>3</sup><br>I <sub>F</sub> = 20 mA,<br>I <sub>OL</sub> = 16 mA                                   |

- \*1. Hysteresis is the difference in LED current between two states when the output state is inverted and expressed as a percentage.
- \*2. The value of the response frequency is measured by rotating the disk as shown below.

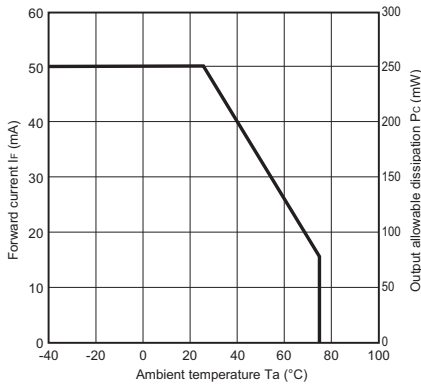


- \*3. Refer to the following diagrams for definitions of response delay time. ( $t_{PHL}$  and  $t_{PLH}$ ) are applicable to EE-SX4081

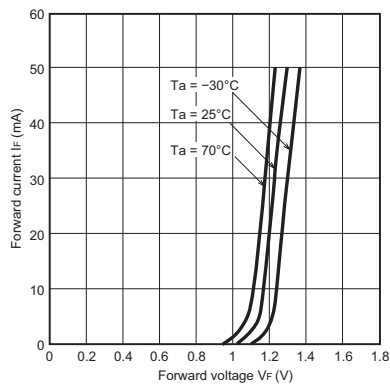


## Engineering Data (Reference Value) Note: Values in parentheses are for EE-SX4081

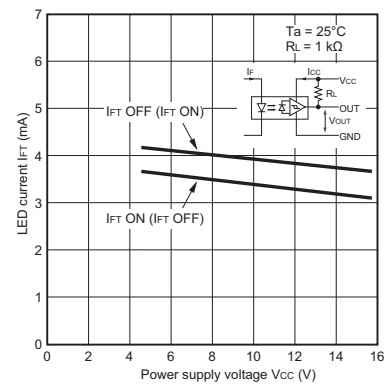
**Fig 1. Forward Current vs. Temperature**



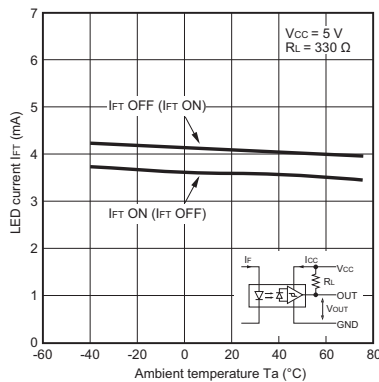
**Fig 2. Forward Current vs. Forward Voltage Characteristics (Typical)**



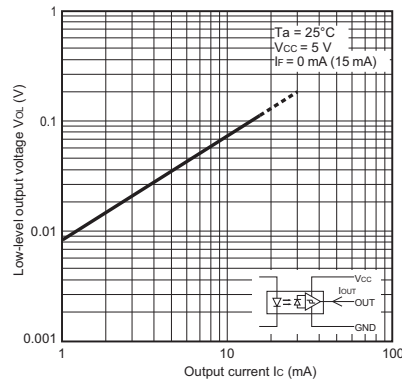
**Fig 3. LED Current When Output ON (OFF) vs. Power Supply Voltage Characteristics (Typical)**



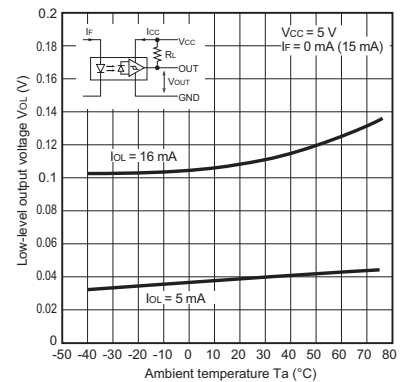
**Fig 4. LED Current When Output ON (OFF) vs. Ambient Temperature Characteristics (Typical)**



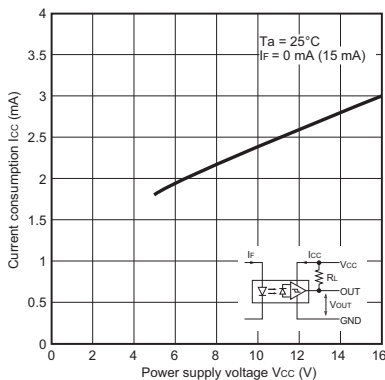
**Fig 5. Low-level Output Voltage vs. Output Current Characteristics (Typical)**



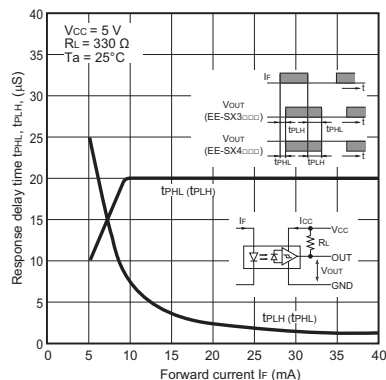
**Fig 6. Low-level Output Voltage vs. Ambient Temperature Characteristics (Typical)**



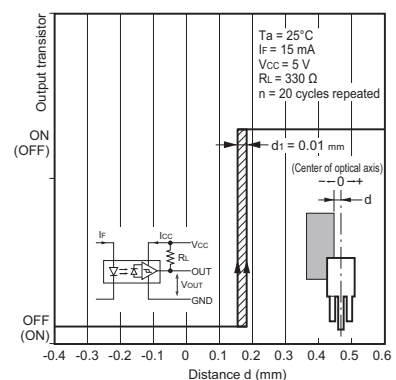
**Fig 7. Current Consumption vs. Power Supply Voltage Characteristics (Typical)**



**Fig 8. Response Delay Time vs. Forward Current Characteristics (Typical)**



**Fig 9. Repeated Sensing Position Characteristics (Typical)**



# 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.  
Dispose of this product as industrial waste.

**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.

**Do not short-circuit the load.**  
Otherwise explosion or burning may occur.

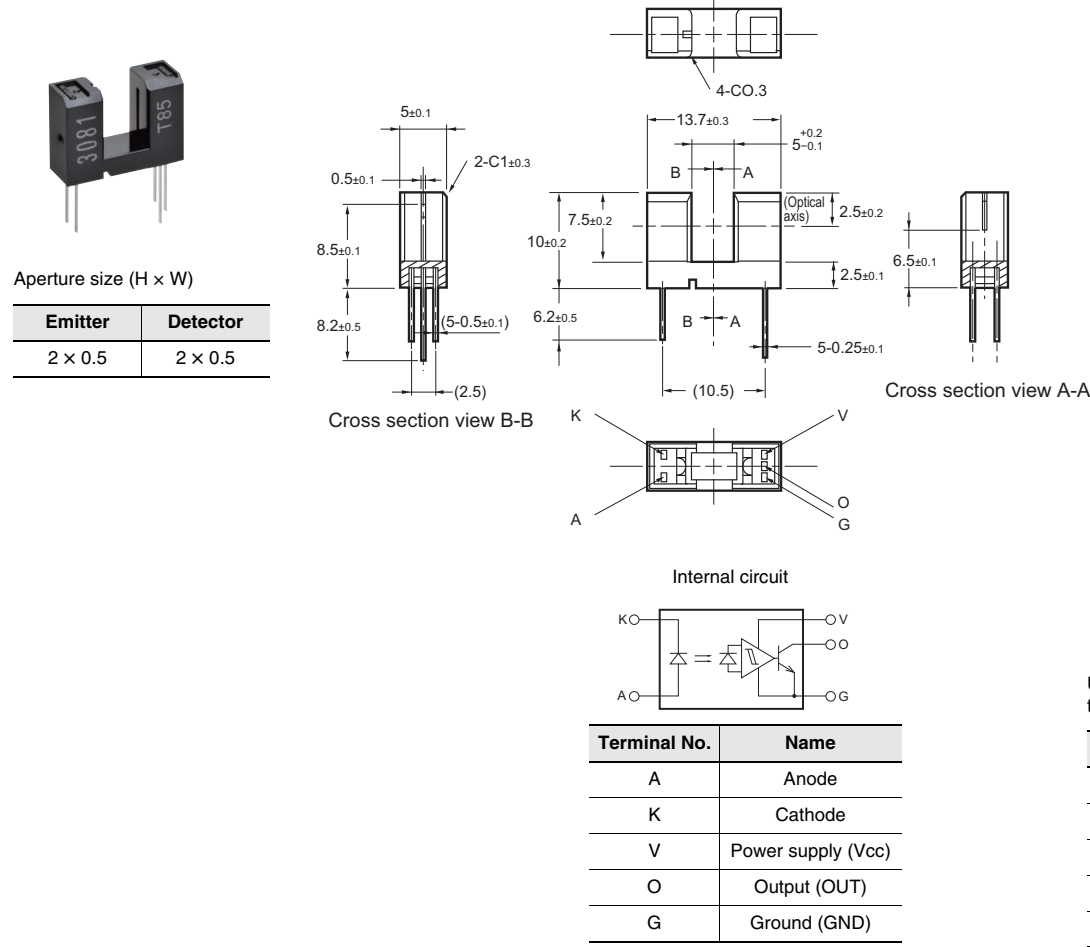
**This product does not resist water. Do not use the product in places where water or oil may be sprayed onto the product.**

## Dimensions and Internal Circuit

(Unit: mm)

### Photomicrosensor

EE-SX3081  
EE-SX4081



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

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## OMRON Corporation

Device & Module Solutions Company

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