

EE-SX1330

Ultra-Compact Slot / SMD Type (Slot width: 3 mm)

- PCB surface mounting type.
- High resolution with a 0.3-mm-wide aperture.

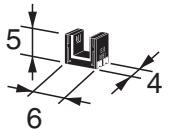


Be sure to read *Safety Precautions* on page 3.



Ordering Information

Photomicrosensor

Appearance	Sensing method	Connecting method	Sensing distance	Aperture size (H × W) (mm)	Output type	Model
	Transmissive (slot type)	SMT	3 mm (slot width)	Emitter 1.4 × 1.4 Detector 1 × 0.3	Phototransistor	EE-SX1330

Ratings, Characteristics and Exterior Specifications

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rated value	Unit
Emitter			
Forward current	I_F	25 *1	mA
Pulse forward current	I_{FP}	100 *2	mA
Reverse voltage	V_R	5	V
Detector			
Collector-Emitter voltage	V_{CEO}	12	V
Emitter-Collector voltage	V_{ECO}	5	V
Collector current	I_C	20	mA
Collector dissipation	P_C	75 *1	mW
Operating temperature	T_{opr}	-30 to +85 *1	°C
Storage temperature	T_{stg}	-40 to +90 *1	°C
Reflow soldering temperature	T_{sol}	255 *3	°C

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

*2. Duty ratio: 1%, Pulse width: 0.1 ms

*3. Complete soldering within 10 seconds for reflow soldering.

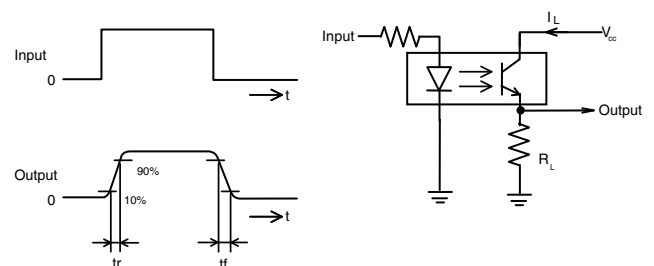
Exterior Specifications

Connecting method	Weight (g)	Material
		Case
SMT	0.2	PPS

Electrical and Optical Characteristics (Ta = 25°C)

Item	Symbol	Value			Unit	Condition
		MIN.	TYP.	MAX.		
Emitter						
Forward voltage	V _F	---	1.1	1.3	V	I _F = 5 mA
Reverse current	I _R	---	---	10	μA	V _R = 5 V
Peak emission wavelength	λ _P	---	940	---	nm	I _F = 20 mA
Detector						
Light current	I _L	100	---	1,000	μA	I _F = 5 mA, V _{CE} = 5 V
Dark current	I _D	---	10	100	nA	V _{CE} = 10 V, 0 lx
Collector-Emitter saturated voltage	V _{CE} (sat)	---	0.1	0.4	V	I _F = 20 mA, I _L = 100 μA
Peak spectral sensitivity wavelength	λ _P	---	900	---	nm	V _{CE} = 5 V
Rising time	t _r	---	19	---	μs	V _{CC} = 5 V, R _L = 100 Ω, I _L = 500 μA
Falling time	t _f	---	26	---	μs	V _{CC} = 5 V, R _L = 100 Ω, I _L = 500 μA

Note: Refer to the following timing diagram for t_r and t_f .



Engineering Data (Reference value)

Fig 1. Forward Current vs. Collector Dissipation Temperature Rating

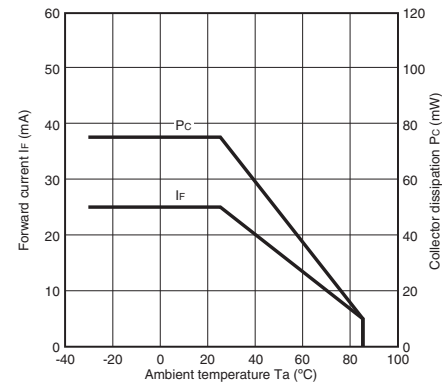


Fig 2. Forward Current vs. Forward Voltage Characteristics (Typical)

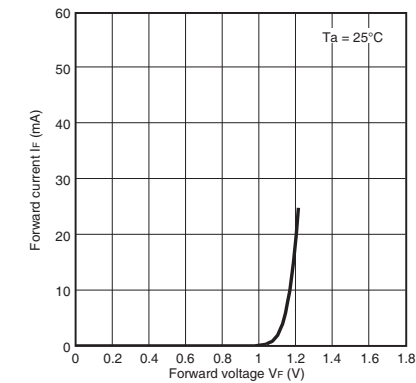


Fig 3. Light Current vs. Forward Current Characteristics (Typical)

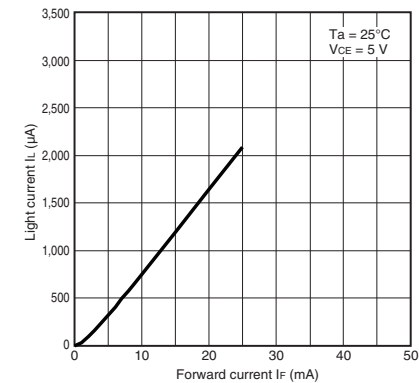


Fig 4. Light Current vs. Collector-Emitter Voltage Characteristics (Typical)

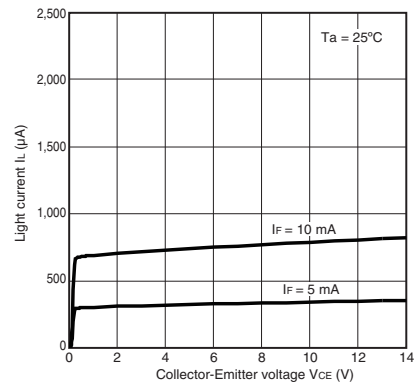


Fig 5. Relative Light Current vs. Ambient Temperature Characteristics (Typical)

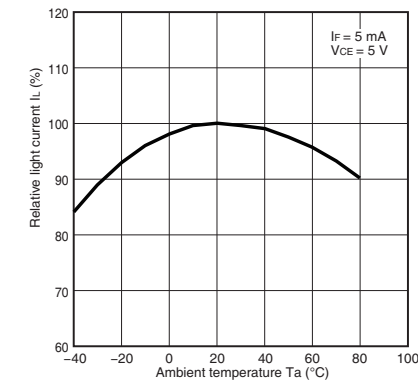


Fig 6. Dark Current vs. Ambient Temperature Characteristics (Typical)

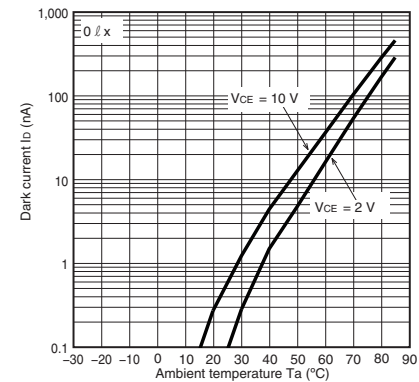


Fig 7. Response Time vs. Load Resistance Characteristics (Typical)

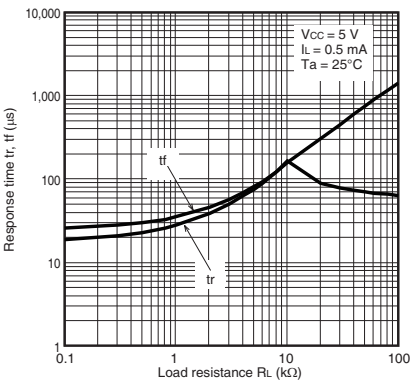


Fig 8. Sensing Position Characteristics (Typical)

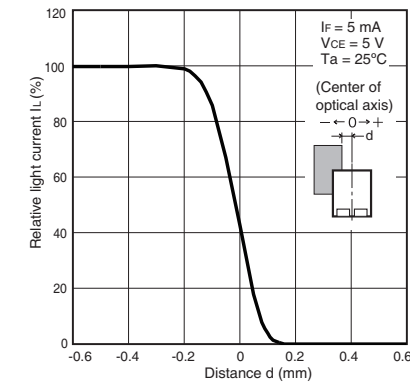
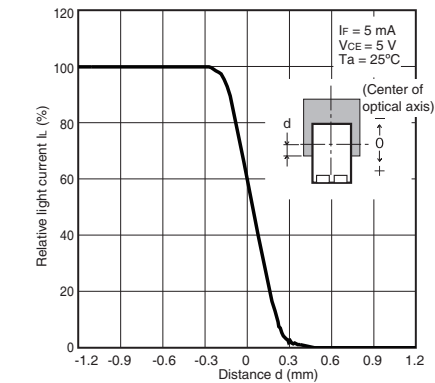


Fig 9. Sensing Position Characteristics (Typical)



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 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.

Precautions for Correct Use

Do not use the product in atmospheres or environments that exceed product ratings. This product is for surface mounting. Refer to Soldering Information, Storage and Baking for details.

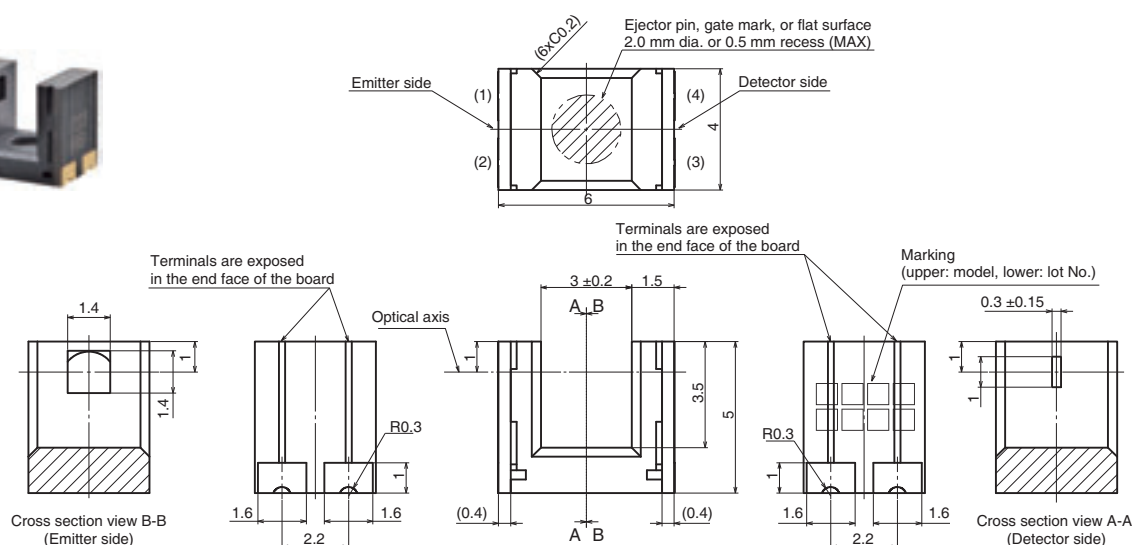
Dispose of this product as industrial waste.

Dimensions and Internal Circuit

(Unit: mm)

Photomicrosensor

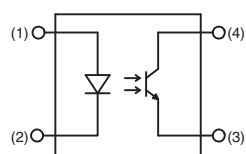
EE-SX1330



Aperture size (H x W)

Emitter	Detector
1.4x1.4	1x0.3

Internal circuit



Terminal No.	Name
(1)	Anode
(2)	Cathode
(3)	Emitter
(4)	Collector

Unless otherwise specified, the tolerances are ± 0.2 mm.

Technical drawing of the CCM-1000 sensor, showing top and side views with dimensions and a label.

Top View Dimensions:

- Outer diameter: 21 ± 0.8 dia.
- Inner diameter: 13 ± 0.2 dia.
- Distance from center to mounting hole: 2 ± 0.5

Side View Dimensions:

- Total height: 330 ± 2 dia.
- Mounting hole diameter: 80 ± 1 dia.
- Mounting hole depth: $W1$
- Mounting hole width: $W2$

Label Information:

Product name: PHOTO MICROSENSOR

Lot number: [] Quantity: []

Country of origin: []

OMRON

Dimensions:

- $W1 = 13.5 \pm 1$
- $W2 = 17.5 \pm 1$

Technical drawing of a tape pull-out specimen. The drawing includes three views: a front view, a side view, and a cross-sectional view.

Front View Dimensions:

- Overall width: 12
- Overall height: 5.5
- Distance from left edge to first hole center: 4
- Distance between hole centers: 2
- Distance from last hole center to right edge: 1.75
- Hole diameter: 1.5 dia.

Side View Dimensions:

- Overall height: 12
- Distance from top edge to hole centerline: 5.5

Cross-sectional View Dimensions:

- Top flange thickness: 0.4
- Inner diameter: (4.2)
- Outer diameter: (5.2)
- Bottom flange thickness: (6.2)

Labels and Orientation:

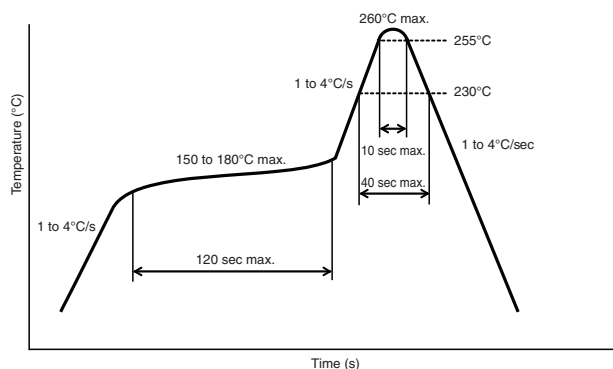
- Labels E, C, K, A are positioned around the cross-section.
- An arrow indicates the "Tape Pull-out direction" pointing to the right.

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Soldering Information

Reflow soldering: Temperature profile

1. The reflow soldering can be implemented in two times complying with the following diagram.
All the temperatures in the product must be within the diagram.
2. The recommended thickness of the metal mask for screen printing is between 0.2 and 0.25 mm.



Manual soldering

The manual soldering should not be applied to the products, otherwise the housing may be deformed and/or the Au plating may be peeled off by heat.

Other notes

The use of infrared lamp causes the temperature at the resin to rise particularly too high.

All the temperatures in the product must be within the above diagram. Do not immerse the resin part into the solder. Even if within the above temperature diagram, there is a possibility that the gold wire in the products is broken in case that the deformation of PC board gives stress to the products.

Please confirm the conditions (including material and method of flux and cleaning) of the reflow soldering fully by actual solder reflow machine prior to the mass production use.

Storage

Storage conditions

To protect the product from the effects of humidity until the package is opened, dry-box storage is recommended. If this is not possible, store the product under the following conditions:

Temperature: 10 to 30 °C

Humidity: 60% RH max.

Treatment after open

1. Reflow soldering must be done within 48 hours stored at the conditions of humidity 60% RH or less and temperature 10 to 30°C.
2. If the product must be stored after it is unpacked, store it in a dry box or reseal it in a moisture-proof package with desiccant at a temperature of 10 to 30°C and a humidity of 60% RH or less. Even then, mount the product within one week.

Baking

In case that it could not carry out the above treatment, it is able to mount by the following baking treatment. However baking treatment shall be limited only 1 time.

Recommended conditions: 60°C for 24 to 48 hours (reeled one)
100°C for 8 to 24 hours (loose one)

- Application examples provided in this document are for reference only. In actual applications, confirm equipment functions and safety before using the product.
- Consult your OMRON representative before using the product under conditions which are not described in the manual or applying the product to nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, safety equipment, and other systems or equipment that may have a serious influence on lives and property if used improperly. Make sure that the ratings and performance characteristics of the product provide a margin of safety for the system or equipment, and be sure to provide the system or equipment with double safety mechanisms.

Note: Do not use this document to operate the Unit.