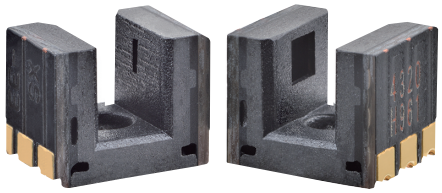
Photomicrosensor (Transmissive)
EE-SX4320

Ultra-Compact Slot / SMD Type (Slot width: 2 mm)

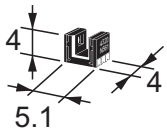


- PCB surface mounting type.
- High resolution with a 0.3-mm-wide aperture.

⚠ **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	**2 mm** (slot width)	Emitter 1.4 × 1.4 Detector 1 × 0.3	Photo IC	**EE-SX4320**

Ratings, Characteristics and Exterior Specifications

Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Rated value	Unit
Emitter				
	Forward current	I_F	25 ✻1	mA
	Reverse voltage	V_R	5	V
Detector				
	Power supply voltage	V_{CC}	9	V
	Output voltage	V_{OUT}	17	V
	Output current	I_{OUT}	8	mA
	Permissible output dissipation	P_{OUT}	80 ✻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 ✻2	°C

✻1. Refer to the temperature rating chart if the ambient temperature exceeds 25°C.
✻2. Complete soldering within 10 seconds for reflow soldering.

Exterior Specifications

Connecting method	Weight (g)	Material
		Case
SMT	0.1	PPS

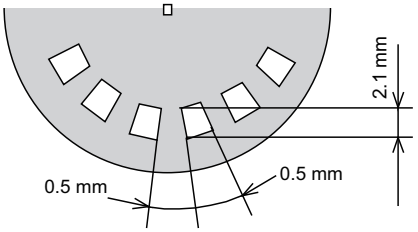
Electrical and Optical Characteristics (Ta = 25°C)

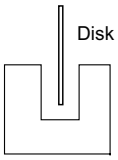
Item		Symbol	Value			Unit	Condition
			MIN.	TYP.	MAX.		
Emitter							
	Forward voltage	V_F	---	1.2	1.4	V	I_F = 20 mA
	Reverse current	I_R	---	0.01	10	μA	V_R = 5 V
	Peak emission wavelength	λ_P	---	940	---	nm	I_F = 20 mA
Detector							
	Power supply voltage	V_{CC}	2.2	---	7	V	---
	Low-level output voltage	V_{OL}	---	0.12	0.4	V	V_{CC} = 2.2 to 7 V, I_F = 7 mA, I_{OL} = 8 mA
	High-level output voltage	I_{OH}	---	---	10	μA	V_{CC} = 2.2 to 7 V, I_F = 0 mA, V_{OH} = 17 V
	Current consumption	I_{CC}	---	2.8	4	mA	V_{CC} = 7 V
	Peak spectral sensitivity wavelength	λ_P	---	870	---	nm	V_{CC} = 2.2 to 7 V
LED current when output is ON		I_{FT}	---	---	3.5	mA	V_{CC} = 2.2 to 7 V
Hysteresis		ΔH	---	21	---	%	V_{CC} = 2.2 to 7 V ✻1
Response frequency		f	3	---	---	kHz	V_{CC} = 2.2 to 7 V, I_F = 5 mA, I_{OL} = 8 mA ✻2
Response delay time		t_{PHL}	---	8	---	μs	V_{CC} = 2.2 to 7 V, I_F = 5 mA, I_{OL} = 8 mA ✻3
		t_{PLH}	---	20	---	μs	V_{CC} = 2.2 to 7 V, I_F = 5 mA, I_{OL} = 8 mA ✻3

✻1. Hysteresis denotes the difference in forward LED current value, expressed in percentage, calculated from the respective forward LED currents when the photo IC in turned from ON to OFF and when the photo IC in turned from OFF to ON.

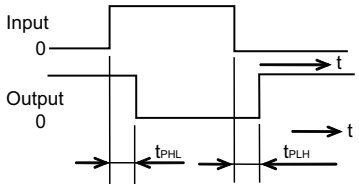
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***2.** The value of the response frequency is measured by rotating the disk as shown below.





***3.** The following illustrations show the definition of response delay time.



Engineering Data (Reference value)

Fig 1. Forward Current vs. Collector Dissipation Temperature Rating

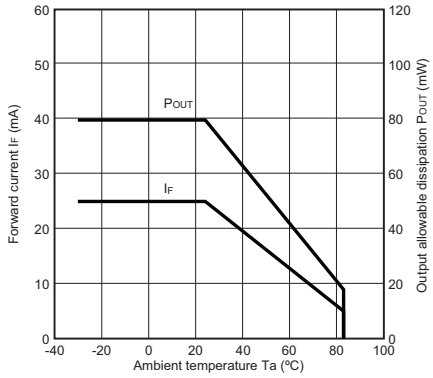


Fig 2. Forward Current vs. Forward Voltage Characteristics (Typical)

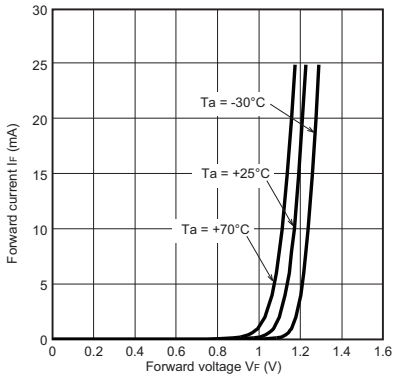


Fig 3. LED Current vs. Supply Voltage (Typical)

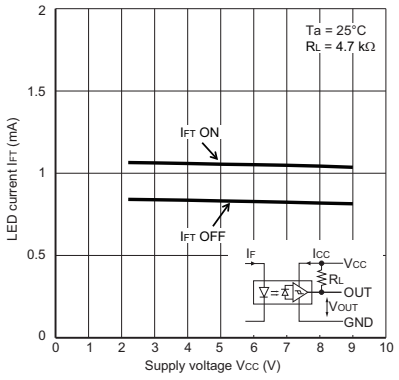


Fig 4.LED Current vs. Ambient Temperature Characteristics (Typical)

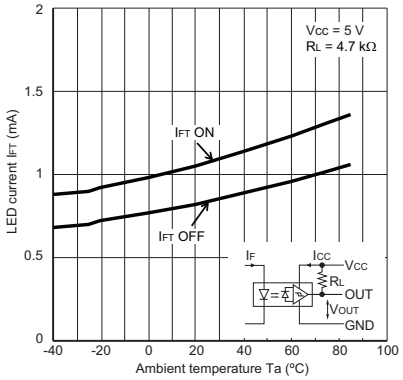


Fig 5. Low-level Output Voltage vs. Output Current (Typical)

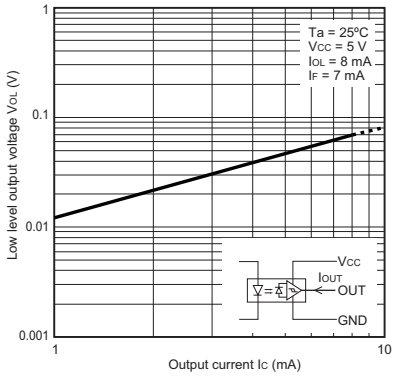


Fig 6. Low-level Output Voltage vs. Ambient Temperature Characteristics (Typical)

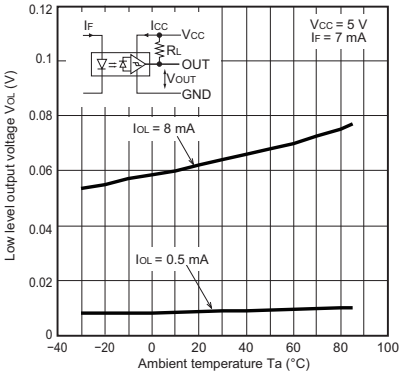


Fig 7. Current Consumption vs. Supply Voltage (Typical)

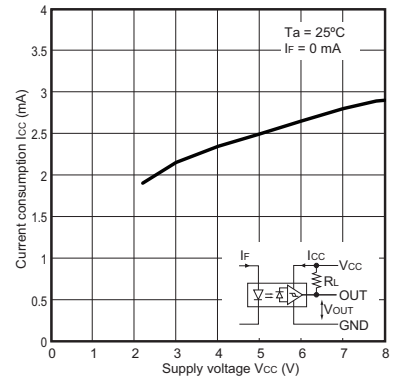


Fig 8. Response Delay Time vs. Forward Current (Typical)

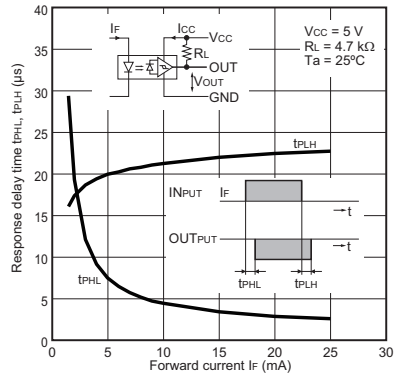
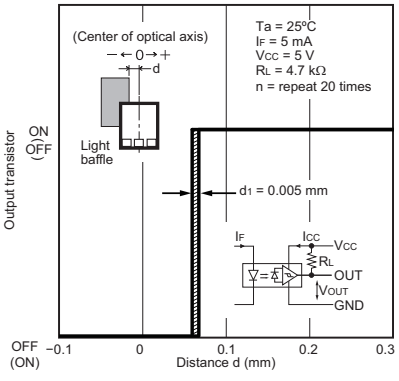


Fig 9. Repeat Sensing Position Characteristics (Typical)



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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.

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.

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

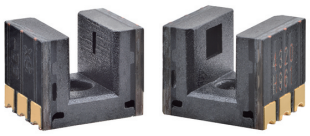
CAD Data marked products, 2D drawings and 3D CAD models are available.
For CAD information, please visit our website, which is noted on the last page.

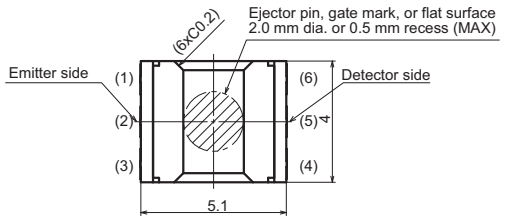
(Unit: mm)

Photomicrosensor

EE-SX4320

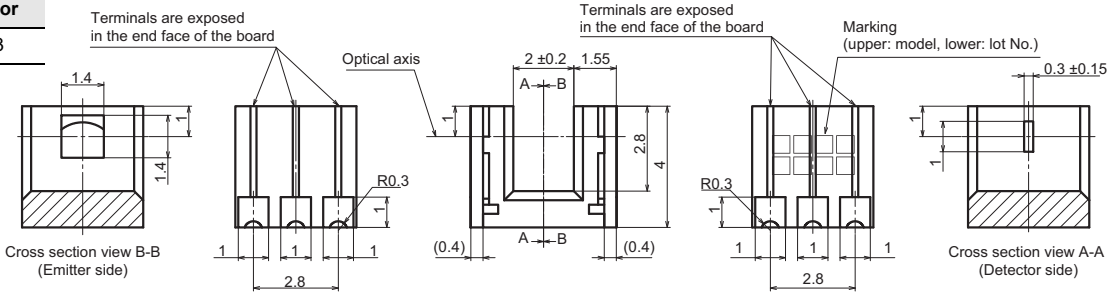
CAD Data



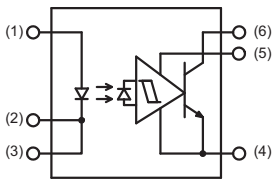


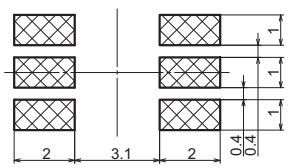
Aperture size (H x W)

Emitter	Detector
1.4×1.4	1×0.3



Internal circuit





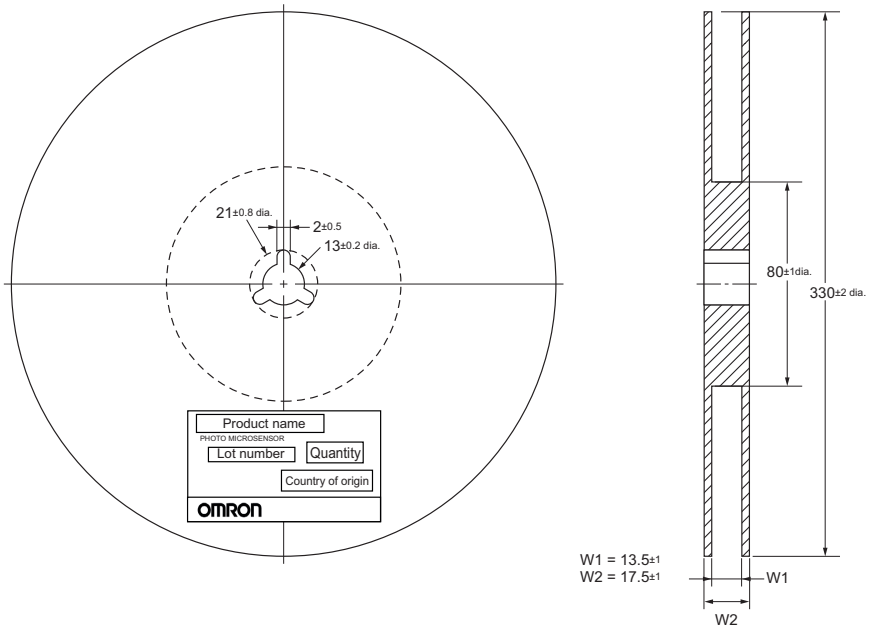
Terminal No.	Name
(1)	Anode
(2)(3)	Cathode
(4)	ground
(5)	Power supply voltage
(6)	Output

Unless otherwise specified, the tolerances are ±0.2 mm.

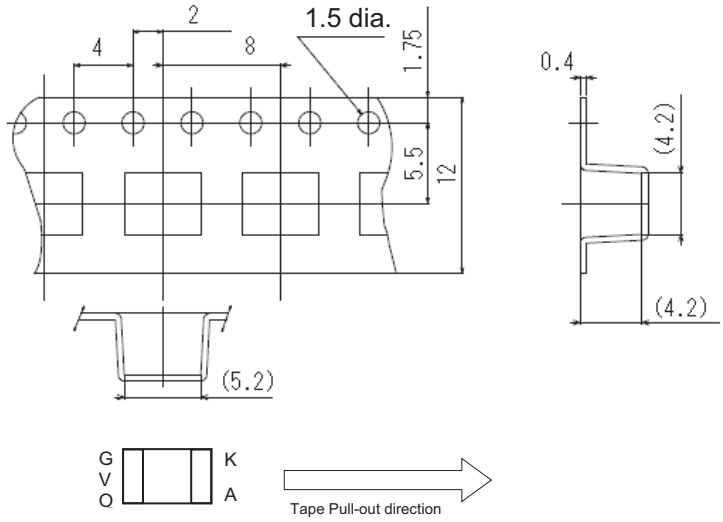
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Tape and Reel

Reel (Unit: mm) ✻



Tape (Unit: mm)



Note: Direction of product packing is upper figure.

Tape quantity

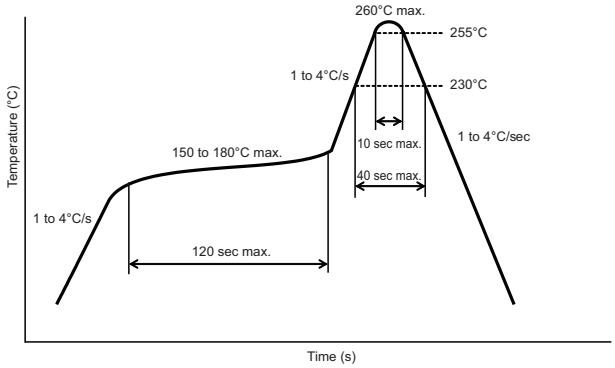
2,000 pcs./reel
100 pcs./pack ✻
✻ EE-SX4320-1 (100 pcs./pack) has no reel, only tape is attached.

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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)

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