

Slot / PCB mounting Type (Slot width: 3.4mm)

- Light-receiving element and amplification circuits contained in one chip.
- Incorporates a detector element with a built-in temperature compensation circuit.
- Can use a power supply voltage of 4.5 to 16 V.
- Directly connectable to C-MOS
- High resolution (0.5 mm) sensing
- Dark-ON: EE-SX305
- Light-ON: EE-SX405

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

RoHS Compliant

Model Number Structure

EE-S X □ 05

(1) (2) (3) (4)

(1)
Photomicrosensor

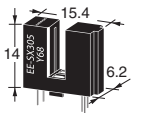
(2)
Transmissive

(3)
3: Photo IC output, Dark-ON
4: Photo IC output, Light-ON

(4)
Serial number

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)	PCB mounting	 3.4 mm (slot width)	Both emitting side and detecting side 2.1 × 0.5	Photo IC	EE-SX305 (Dark-ON) EE-SX405 (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
Emitter			
Forward current	I _F	50 *1	mA
Reverse voltage	V _R	4	V
Detector			
Power supply voltage	V _{CC}	16	V
Output voltage	V _{OUT}	28	V
Output current	I _{OUT}	16	mA
Permissible output dissipation	P _{OUT}	250 *1	mW
Operating temperature	T _{opr}	-40 to +75	°C
Storage temperature	T _{stg}	-40 to +85	°C
Soldering temperature	T _{sol}	260 *2	°C

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

*2. Complete soldering within 10 seconds.

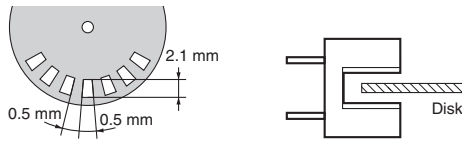
Exterior Specifications

Connecting method	Weight (g)	Material
		Case
PCB mounting	1.4	Polycarbonate

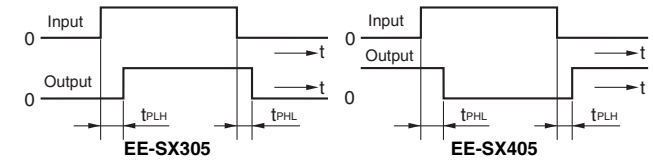
Electrical and Optical Characteristics (Ta = 25°C)

Item	Sym bol	Value			Unit	Condition
		MIN.	TYP.	MAX.		
Emitter						
Forward voltage	V _F	---	1.2	1.5	V	I _F = 20 mA
Reverse current	I _R	---	0.01	10	μA	V _R = 4 V
Peak emission wavelength	λ _P	---	940	---	nm	I _F = 20 mA
Detector						
Low-level output voltage	V _{OL}	---	0.12	0.4	V	V _{CC} = 4.5 to 16 V, I _{OL} = 16 mA, I _F = 0 mA (EE-SX305), I _F = 8 mA (EE-SX405)
High-level output voltage	V _{OH}	15	---	---	V	V _{CC} = 16 V, R _L = 1 kΩ, I _F = 8 mA (EE-SX305), I _F = 0 mA (EE-SX405)
Current consumption	I _{CC}	---	3.2	10	mA	V _{CC} = 16 V
Peak spectral sensitivity wavelength	λ _P	---	870	---	nm	V _{CC} = 4.5 to 16 V
LED current when output is OFF	I _{FT}	---	3	8	mA	V _{CC} = 4.5 to 16 V
LED current when output is ON						
Hysteresis	ΔH	---	15	---	%	V _{CC} = 4.5 to 16 V *1
Response frequency	f	3	---	---	kHz	V _{CC} = 4.5 to 16 V *2, I _F = 15 mA, I _{OL} = 16 mA
Response delay time	t _{PLH} (t _{PHL})	---	3	---	μs	V _{CC} = 4.5 to 16 V *3, I _F = 15 mA, I _{OL} = 16 mA
Response delay time	t _{PHL} (t _{PLH})	---	20	---	μs	V _{CC} = 4.5 to 16 V *3 I _F = 15 mA, I _{OL} = 16 mA

- *1. Hysteresis denotes the difference in forward LED current value, expressed in percentage, calculated from the respective forward LED currents when the photo IC is turned from ON to OFF and when the photo IC is turned from OFF to ON.
- *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. The value in the parentheses applies to the EE-SX405.



Engineering Data (Reference value)

Note: The value in the parentheses applies to the EE-SX405.

Fig 1. Forward Current vs. Output Allowable Dissipation Temperature Rating

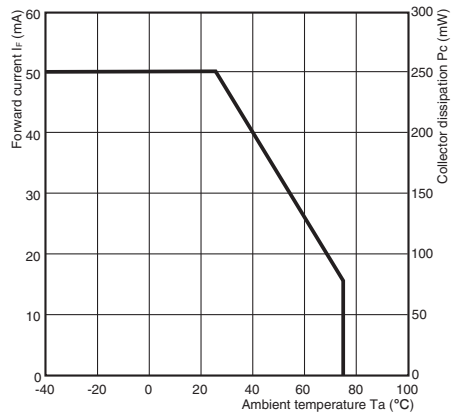


Fig 2. Forward Current vs. Forward Voltage Characteristics (Typical)

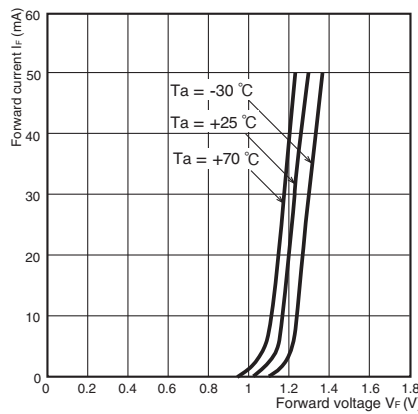


Fig 3. LED Current vs. Supply Voltage (Typical)

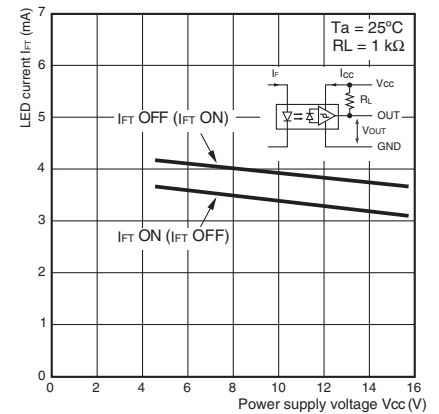


Fig 4. LED Current vs. Ambient Temperature Characteristics (Typical)

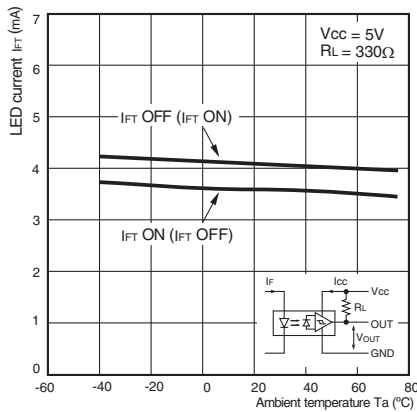


Fig 5. Low-level Output Voltage vs. Output Current (Typical)

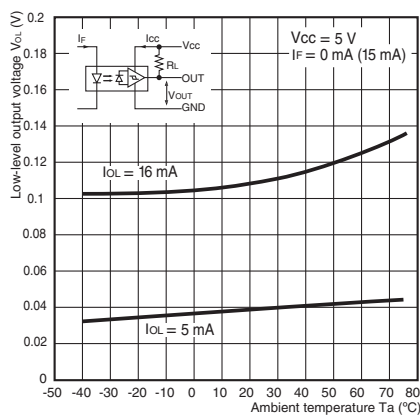


Fig 6. Low-level Output Voltage vs. Ambient Temperature Characteristics (Typical)

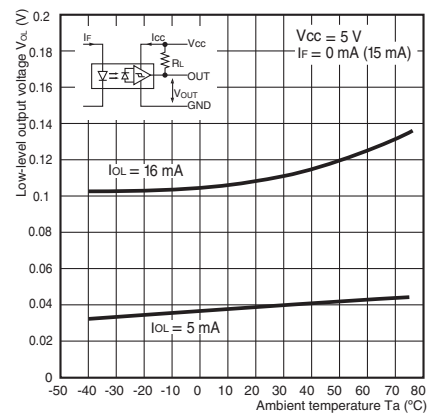


Fig 7. Current Consumption vs. Supply Voltage (Typical)

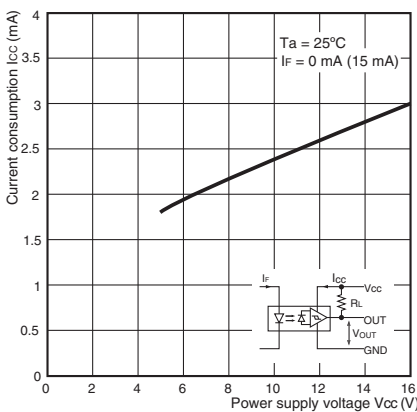


Fig 8. Response Delay Time vs. Forward Current (Typical)

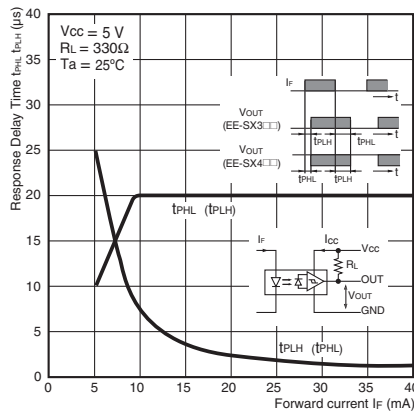
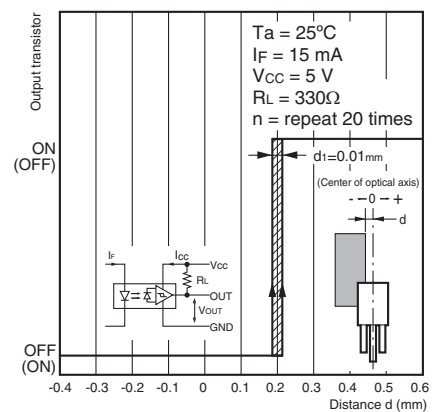


Fig 9. Repeat Sensing Position Characteristics (Typical)



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.

Dimensions and Internal Circuit

(Unit: mm)

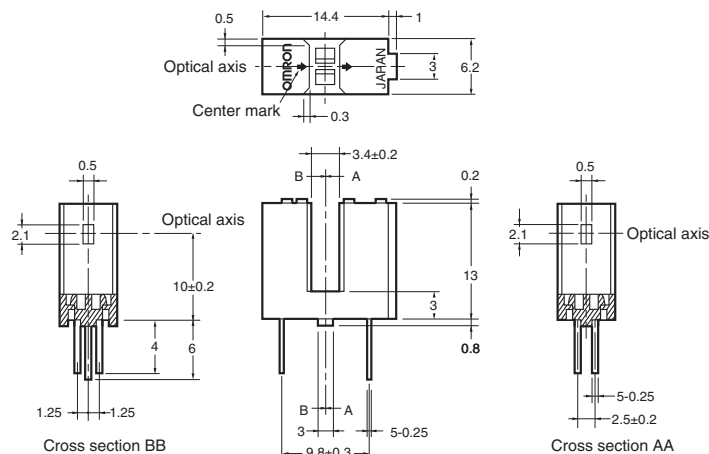
Photomicrosensor

EE-SX305
EE-SX405

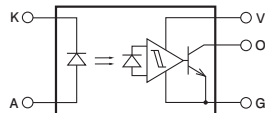


Aperture size (H × W) (mm)

Input	Output
2.1 × 0.5	2.1 × 0.5



Internal circuit



Terminal No.	Name
A	Anode
K	Cathode
V	Power supply (Vcc)
O	Output voltage (OUT)
G	Ground (GND)

Unless otherwise specified, the tolerances are as shown below.

Dimensions	Tolerance
3 mm max.	±0.3
3 < mm ≤ 6	±0.375
6 < mm ≤ 10	±0.45
10 < mm ≤ 18	±0.55
18 < mm ≤ 30	±0.65

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