Photomicrosensor (Transmissive)

EE-SX1031

Dual Channel Phototransistor Output Ideal for Encoder Applications

- High resolution (0.5 mm) sensing
- Separate LED/Phototransistor combinations within a single housing

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



Model Number Structure

EE-S X 1 031

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

(1) Photomicrosensor

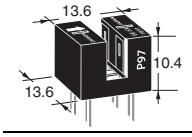
(2) Transmissive

(3) Phototransistor output

(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 2 ch	Phototransistor (Dual-channel output)	**EE-SX1031**	**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
Input				
	Forward current	I_F	50 *1	mA
	Pulse forward current	I_{FP}	---	A
	Reverse voltage	V_R	4	V
Output				
	Collector-Emitter voltage	V_{CEO}	30	V
	Emitter-Collector voltage	V_{ECO}	---	V
	Collector current	I_C	20	mA
	Collector dissipation	P_C	100 *1	mW
Operating temperature		T_{opr}	-25 to 85	°C
Storage temperature		T_{stg}	-30 to 100	°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	1.47	Polycarbonate

Electrical and Optical Characteristics (Ta = 25°C)

Item		Symbol	Value			Unit	Condition
			MIN.	TYP.	MAX.		
Emitter							
	Forward voltage	V_F	---	1.2	1.5	V	I_F = 30 mA
	Reverse current	I_R	---	0.01	10	μA	V_R = 4 V
	Peak emission wavelength	λ_P(L)	---	940	---	nm	I_F = 20 mA
Detector							
	Dark current	I_D	---	2	200	nA	V_{CE} = 10 V, 0 lx
	Peak spectral sensitivity wavelength	λ_P(P)	---	850	---	nm	V_{CE} = 10 V
Combination							
	Light current (collector current)	I_L	0.5	---	14	mA	I_F = 20 mA, V_{CE} = 10 V
	Collector-emitter saturated voltage	V_{CE} (sat)	---	0.15	0.4	V	I_F = 20 mA, I_L = 0.1 mA
	Rising time	tr	---	4	---	μs	V_{CC} = 5 V, R_L = 100 Ω I_L = 5 mA
	Falling time	tf	---	4	---	μs	V_{CC} = 5 V, R_L = 100 Ω I_L = 5 mA

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Engineering Data (Reference value)

Fig 1. Forward Current vs. Collector Dissipation Temperature Rating

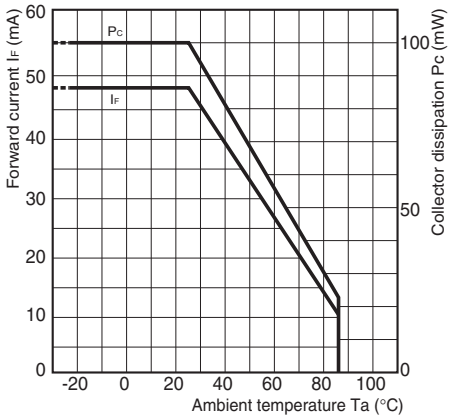


Fig 2. Forward Current vs. Forward Voltage Characteristics (Typical)

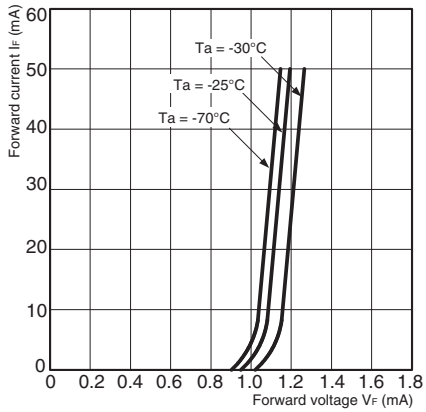


Fig 3. Light Current vs. Forward Current Characteristics (Typical)

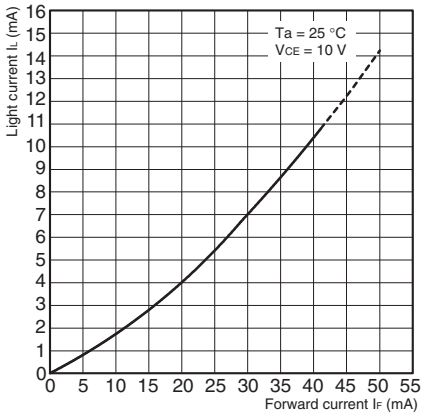


Fig 4. Light Current vs. Collector-Emitter Voltage Characteristics (Typical)

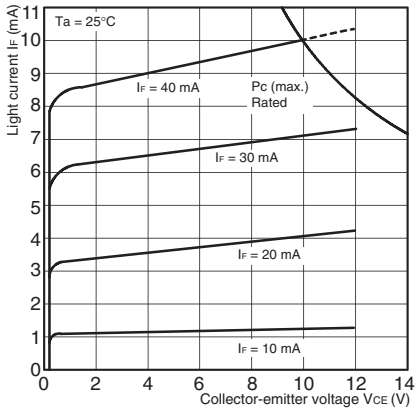


Fig 5. Relative Light Current vs. Ambient Temperature Characteristics (Typical)

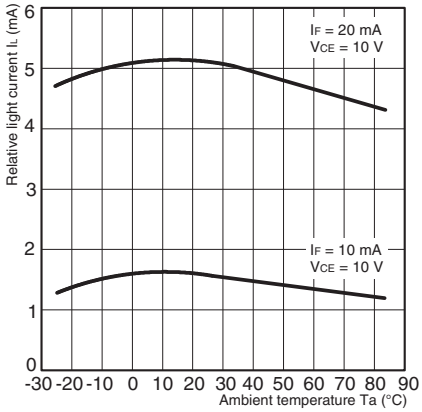


Fig 6. Dark Current vs. Ambient Temperature Characteristics (Typical)

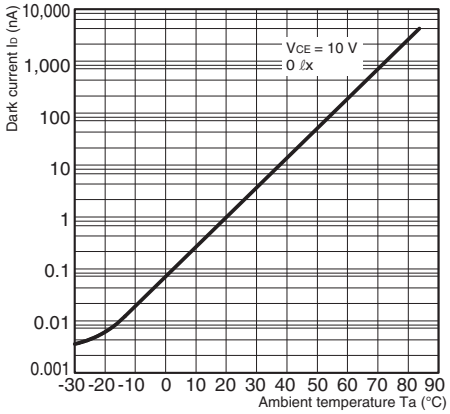


Fig 7. Response Time vs. Load Resistance Characteristics (Typical)

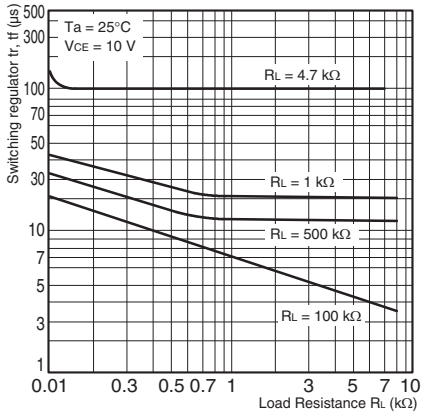


Fig 8. Sensing Position Characteristics (Typical)

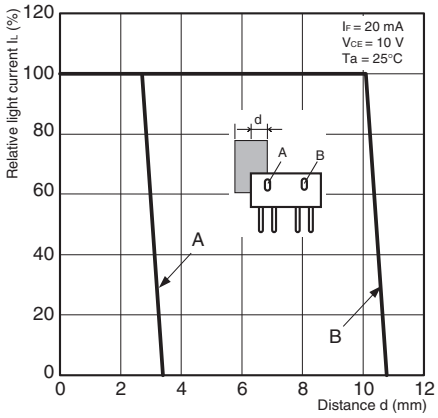
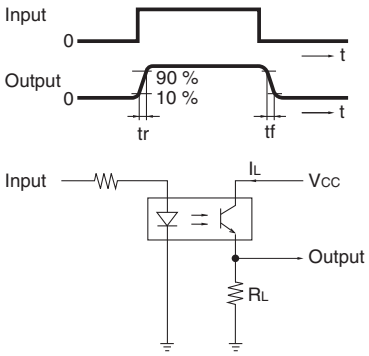


Fig 9. Response Time Measurement Circuit



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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.

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.

Dimensions and Internal Circuit

(Unit: mm)

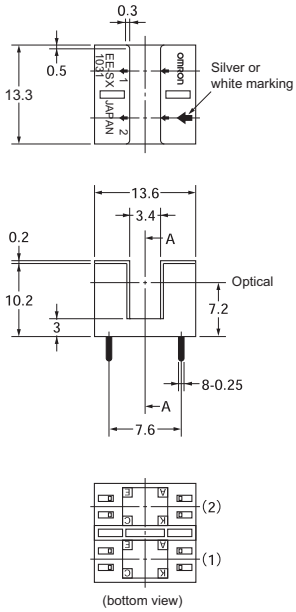
Photomicrosensor

EE-SX1031



Aperture size (H × W)

Emitter	Detector
2.1 × 0.5 2ch	2.1 × 0.5 2ch

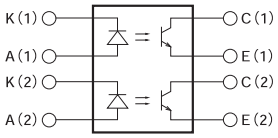


(bottom view)

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

Internal circuit



Terminal No.	Name
A	Anode
K	Cathode
C	Collector
E	Emitter

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