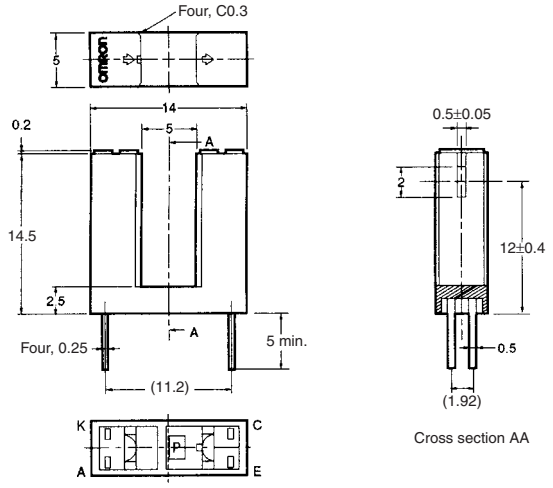
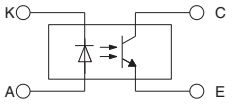
# Photomicrosensor (Transmissive)
# EE-SX1042

## ■ Dimensions

**Note:** All units are in millimeters unless otherwise indicated.




**Internal Circuit**




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

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 |

## ■ Features

- 14.5-mm-tall model with a deep slot.
- PCB mounting type.
- High resolution with a 0.5-mm-wide aperture.
- RoHS Compliant.

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

| Item | | Symbol | Rated value |
|---|---|---|---|
| Emitter | Forward current | $I_F$ | 50 mA (see note 1) |
| | Pulse forward current | $I_{FP}$ | 1 A (see note 2) |
| | Reverse voltage | $V_R$ | 4 V |
| Detector | Collector–Emitter voltage | $V_{CEO}$ | 30 V |
| | Emitter–Collector voltage | $V_{ECO}$ | --- |
| | Collector current | $I_C$ | 20 mA |
| | Collector dissipation | $P_C$ | 100 mW (see note 1) |
| Ambient temperature | Operating | $T_{opr}$ | –25°C to 85°C |
| | Storage | $T_{stg}$ | –30°C to 100°C |
| Soldering temperature | | $T_{sol}$ | 260°C (see note 3) |

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

**2.** The pulse width is 10 μs maximum with a frequency of 100 Hz.

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

## ■ Ordering Information

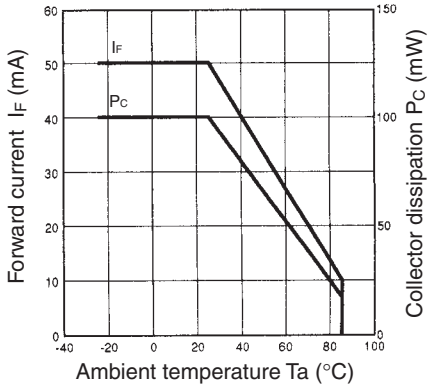
| Description | Model |
|---|---|
| Photomicrosensor (transmissive) | **EE-SX1042** |

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

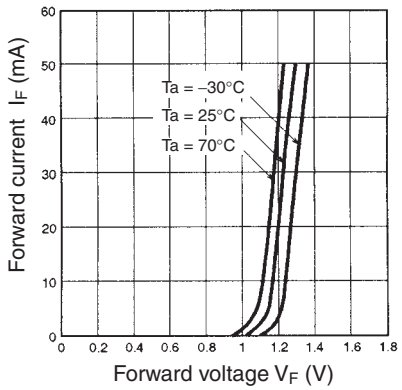
| Item | | Symbol | Value | Condition |
|---|---|---|---|---|
| Emitter | Forward voltage | $V_F$ | 1.2 V typ., 1.5 V max. | $I_F$ = 30 mA |
| | Reverse current | $I_R$ | 0.01 μA typ., 10 μA max. | $V_R$ = 4 V |
| | Peak emission wavelength | $\lambda_P$ | 940 nm typ. | $I_F$ = 20 mA |
| Detector | Light current | $I_L$ | 0.5 mA min., 10 mA max. | $I_F$ = 20 mA, $V_{CE}$ = 10 V |
| | Dark current | $I_D$ | 2 nA typ., 200 nA max. | $V_{CE}$ = 10 V, 0 ℓx |
| | Leakage current | $I_{LEAK}$ | --- | --- |
| | Collector–Emitter saturated voltage | $V_{CE\ (sat)}$ | 0.1 V typ., 0.4 V max. | $I_F$ = 20 mA, $I_L$ = 0.1 mA |
| | Peak spectral sensitivity wavelength | $\lambda_P$ | 850 nm typ. | $V_{CE}$ = 10 V |
| Rising time | | tr | 4 μs typ. | $V_{CC}$ = 5 V, $R_L$ = 100 Ω, $I_L$ = 5 mA |
| Falling time | | tf | 4 μs typ. | $V_{CC}$ = 5 V, $R_L$ = 100 Ω, $I_L$ = 5 mA |

## ■ Engineering Data

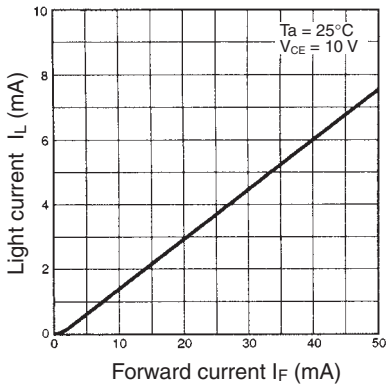
### Forward Current vs. Collector Dissipation Temperature Rating



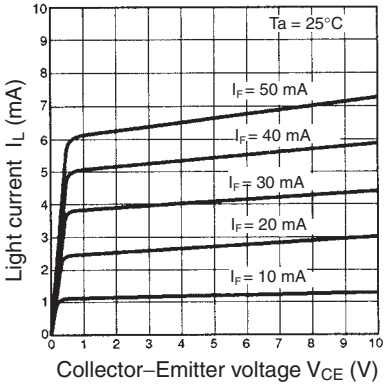

### Forward Current vs. Forward Voltage Characteristics (Typical)



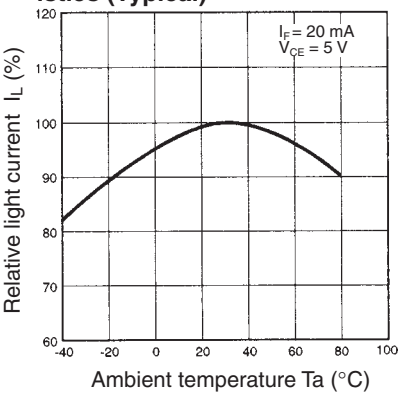

### Light Current vs. Forward Current Characteristics (Typical)



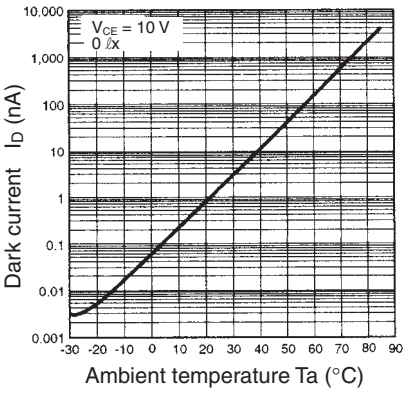

### Light Current vs. Collector–Emitter Voltage Characteristics (Typical)



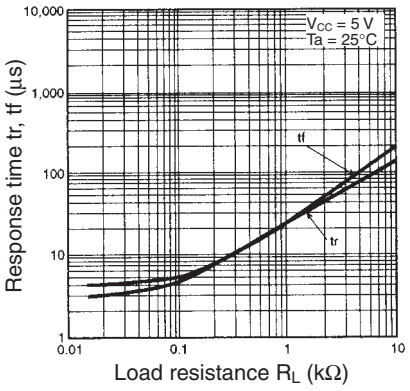

### Relative Light Current vs. Ambient Temperature Characteristics (Typical)



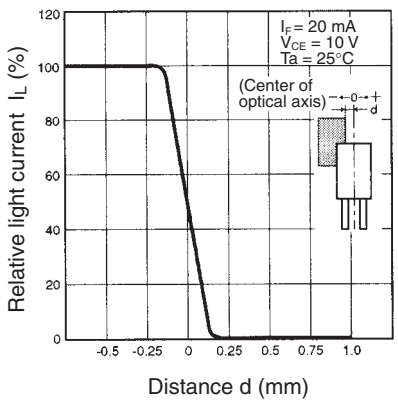

### Dark Current vs. Ambient Temperature Characteristics (Typical)



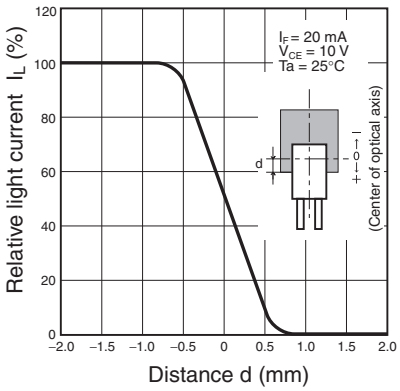

### Response Time vs. Load Resistance Characteristics (Typical)



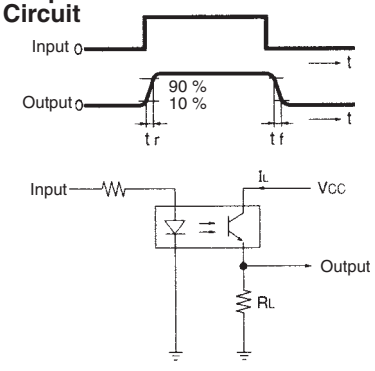

### Sensing Position Characteristics (Typical)




### Sensing Position Characteristics (Typical)




### Response Time Measurement Circuit



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