OMRON

Photomicrosensor (Actuator Mounted)
EE-SA104

⚠ **Be sure to read *Precautions* on page 25.**

■ Dimensions

Note: All units are in millimeters unless otherwise indicated.

Cross section BB

Internal Circuit

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

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

Cross section AA

■ Features

• An actuator can be attached.
• PCB mounting type.
• High resolution with a 0.5-mm-wide aperture.

■ 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	Topr	−25°C to 85°C
	Storage	Tstg	−30°C to 100°C
Soldering temperature		Tsol	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.

■ 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	λ_P	940 nm typ.	I_F = 20 mA
Detector	Light current	I_L	0.5 mA min., 14 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	λ_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 I_F (mA) / Collector dissipation P_C (mW) vs. Ambient temperature Ta (°C)
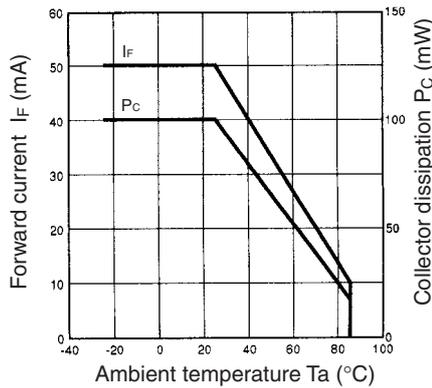
Forward Current vs. Forward Voltage Characteristics (Typical)

Forward current I_F (mA) vs. Forward voltage V_F (V)
Ta = −30°C, Ta = 25°C, Ta = 70°C
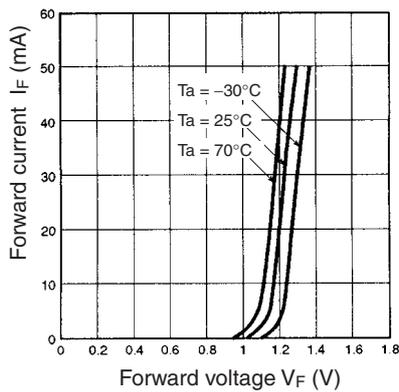
Light Current vs. Forward Current Characteristics (Typical)

Light current I_L (mA) vs. Forward current I_F (mA)
Ta = 25°C, V_{CE} = 10 V
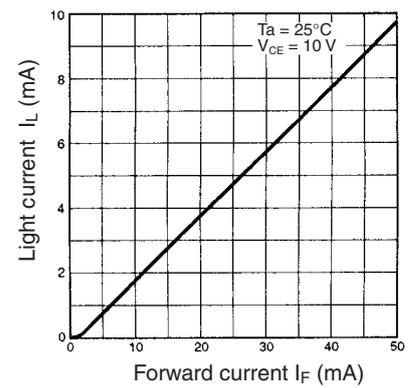
Light Current vs. Collector−Emitter Voltage Characteristics (Typical)

Light current I_L (mA) vs. Collector−Emitter voltage V_{CE} (V)
Ta = 25°C, I_F = 50 mA, I_F = 40 mA, I_F = 30 mA, I_F = 20 mA, I_F = 10 mA
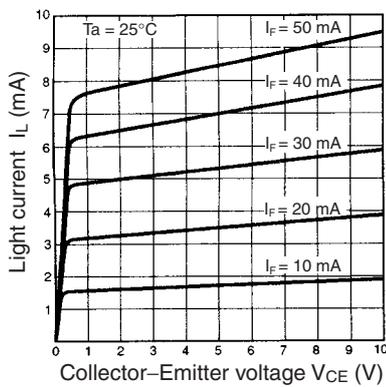
Relative Light Current vs. Ambient Temperature Characteristics (Typical)

Relative light current I_L (%) vs. Ambient temperature Ta (°C)
I_F = 20 mA, V_{CE} = 5 V

Dark Current vs. Ambient Temperature Characteristics (Typical)

Dark current I_D (nA) vs. Ambient temperature Ta (°C)
V_{CE} = 10 V, 0 lx
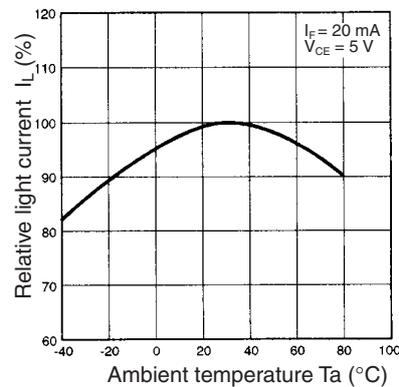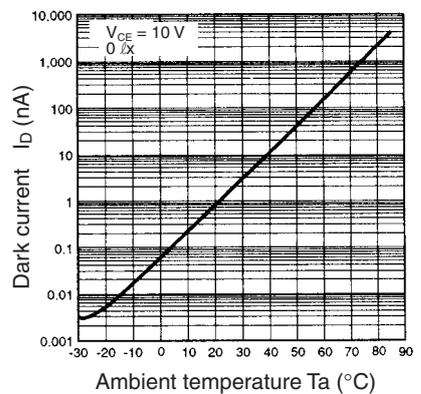
Response Time vs. Load Resistance Characteristics (Typical)
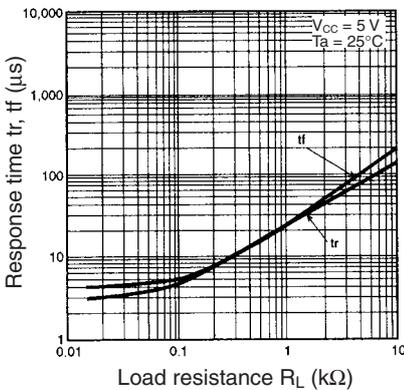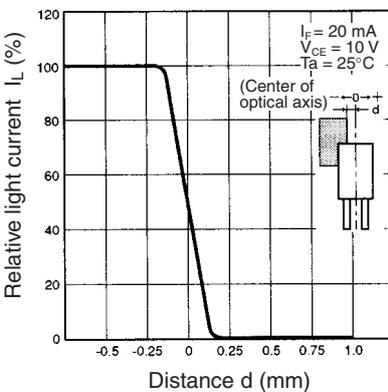
Response time tr, tf (µs) vs. Load resistance R_L (kΩ)
V_{CC} = 5 V, Ta = 25°C
tf, tr

Sensing Position Characteristics (Typical)

Relative light current I_L (%) vs. Distance d (mm)
I_F = 20 mA, V_{CE} = 10 V, Ta = 25°C
(Center of optical axis)

Sensing Position Characteristics (Typical)

Relative light current I_L (%) vs. Distance d (mm)
I_F = 20 mA, V_{CE} = 10 V, Ta = 25°C
(Center of optical axis)
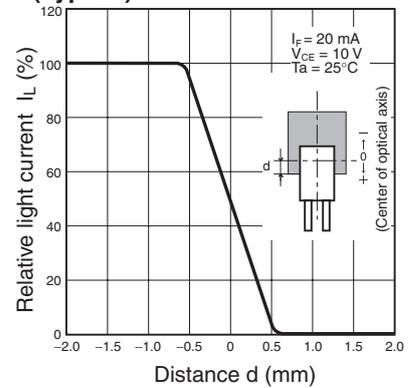
Response Time Measurement Circuit

Input
Output
90 %
10 %
t r
t f
Input — R — I_L — V_{CC}
Output
R_L

Actuator Dimensions

2.2±0.1 dia.
1.5 $_{-0.1}^{0}$ dia.
5.6±0.1
9.2±0.2
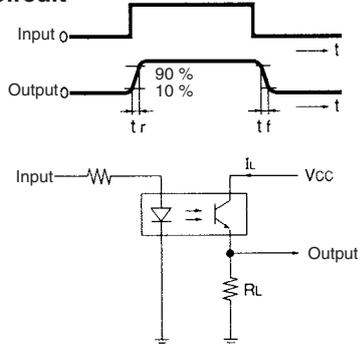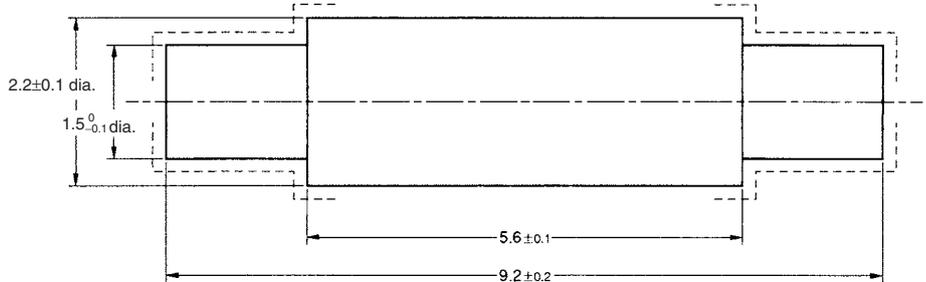
Note: 1. Make sure that the portions marked with dotted lines have no burrs.
2. The material of the actuator must be selected by considering the infrared permeability of the actuator.

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