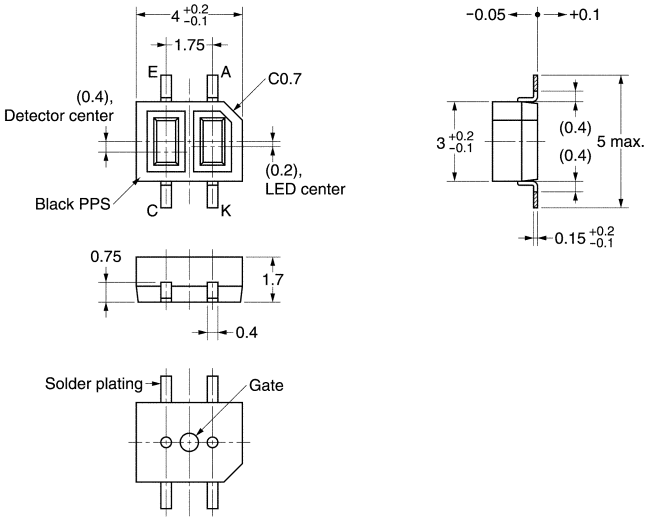
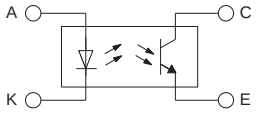
Photomicrosensor (Reflective)
EE-SY125

■ Dimensions

Note: All units are in millimeters unless otherwise indicated.



Internal Circuit



Unless otherwise specified, the tolerances are ±0.15 mm.

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

■ Features

- Ultra-compact model.
- PCB surface mounting type

■ 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}	5 V
	Collector current	I_C	20 mA
	Collector dissipation	P_C	75 mW (see note 1)
Ambient temperature	**Operating**	Topr	–25°C to 85°C
	Storage	Tstg	–40°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.

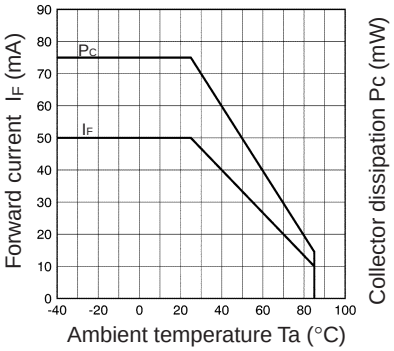
■ Electrical and Optical Characteristics (Ta = 25°C)

Item		Symbol	Value	Condition
Emitter	**Forward voltage**	V_F	1.2 V typ., 1.4 V max.	I_F = 20 mA
	Reverse current	I_R	0.01 μA typ., 10 μA max.	V_R = 4 V
	Peak emission wavelength	λ_P	950 nm typ.	I_F = 4 mA
Detector	**Light current**	I_L	50 μA min., 300 μA max.	I_F = 4 mA, V_{CE} = 2 V Aluminum-deposited surface, d = 1 mm (see note)
	Dark current	I_D	2 nA typ., 200 nA max.	V_{CE} = 10 V, 0 ℓx
	Leakage current	I_{LEAK}	200 nA max.	I_F =4 mA, V_{CE} = 2 V with no reflection
	Collector–Emitter saturated voltage	V_{CE} (sat)	---	---
	Peak spectral sensitivity wavelength	λ_P	930 nm typ.	V_{CE} = 10 V
Rising time		tr	35 μs typ.	V_{CC} = 2 V, R_L = 1 kΩ, I_L = 100 μA
Falling time		tf	25 μs typ.	V_{CC} = 2 V, R_L = 1 kΩ, I_L = 100 μA

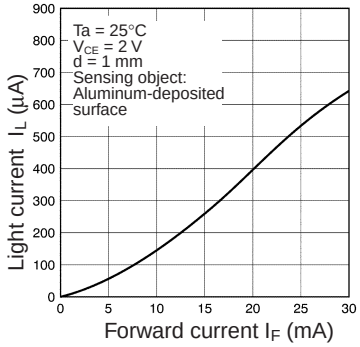
Note: The letter “d” indicates the distance between the top surface of the sensor and the sensing object.

■ Engineering Data

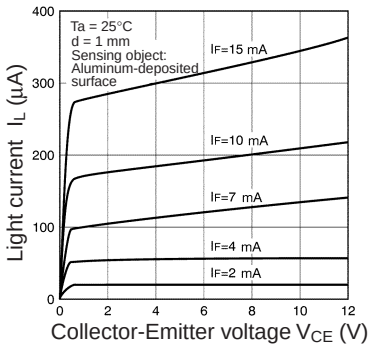
Forward Current vs. Collector Dissipation Temperature Rating



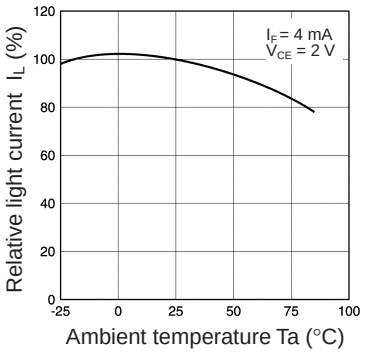
Light Current vs. Forward Current Characteristics (Typical)



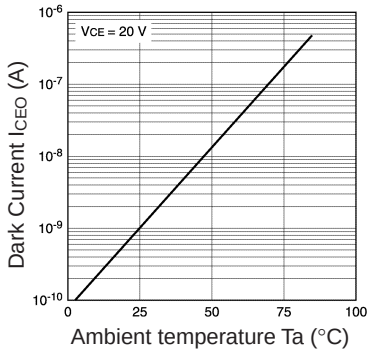
Light Current vs. Collector-Emitter Voltage Characteristics (Typical)



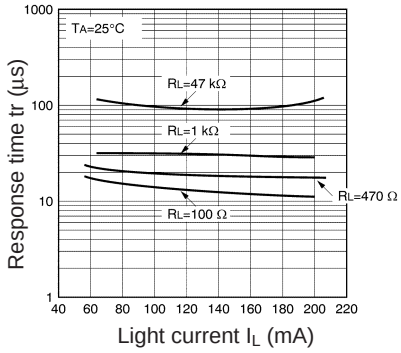
Relative Light Current vs. Ambient Temperature Characteristics (Typical)



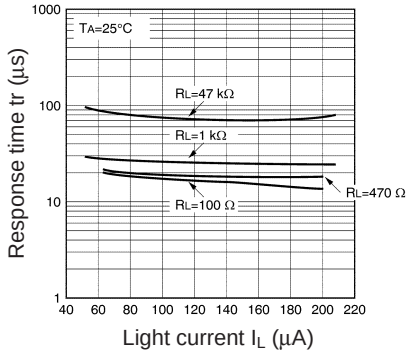
Dark Current vs. Ambient Temperature Characteristics (Typical)



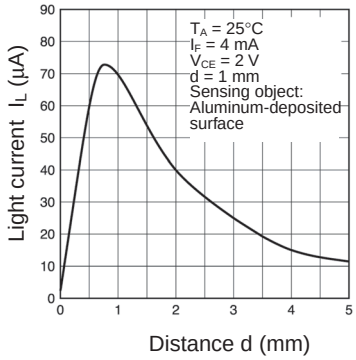
Response Time vs. Load Resistance Characteristics (Typical)



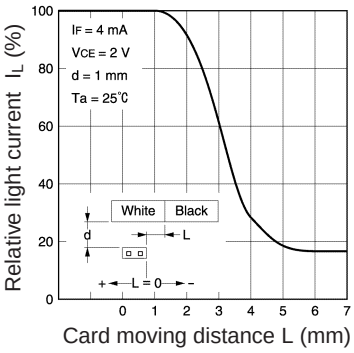
Response Time vs. Load Resistance Characteristics (Typical)



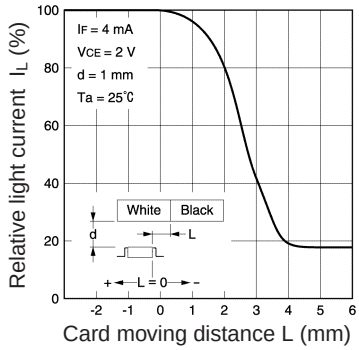
Sensing Distance Characteristics (Typical)



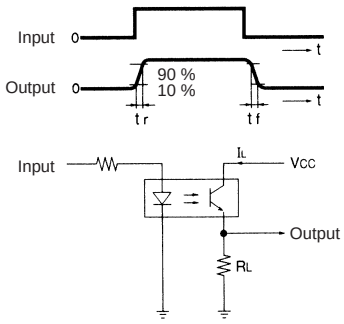
Relative Light Current vs. Card Moving Distance (1)



Relative Collector Current vs. Card Moving Distance (2)



Response Time Measurement Circuit

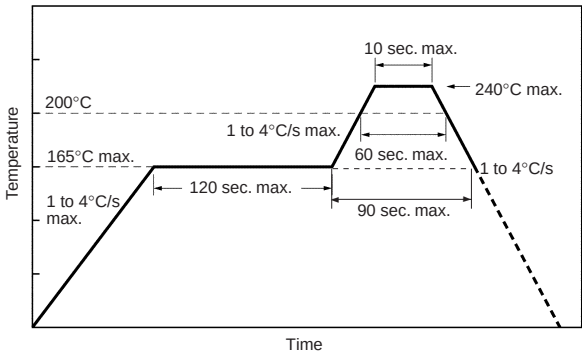


Precautions

■ Soldering Information

Reflow soldering

- Set the reflow oven so that the temperature profile shown in the following chart is obtained for the upper surface of the product being soldered.



Manual soldering

- Use a soldering iron of less than 25 W, and keep the temperature of the iron tip at 260°C or below.
- Solder each point for a maximum of three seconds.
- After soldering, allow the product to return to room temperature before handling it.

Storage

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: 5 to 30°C

Humidity: 70% max.

The product is packed in a humidity-proof envelope. Reflow soldering must be done within 48 hours after opening the envelope, during which time the product must be stored at 5 to 25°C at 60% maximum humidity.

If it is necessary to store the product after opening the envelope, use dry-box storage or reseal the envelope at 5 to 30°C at 70% maximum humidity within two weeks.

Baking

If a product has remained packed in a humidity-proof envelope for six months or more, or if more than 48 hours have lapsed since the envelope was opened, bake the product under the following conditions before use only one time:

Bulk:125°C for 16 to 24 hours