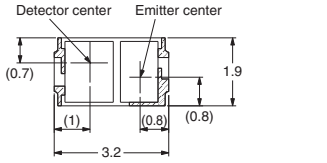
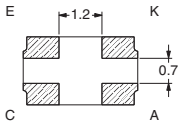
Photomicrosensor (Reflective)
EE-SY1200

■ Dimensions

Note: All units are in millimeters unless otherwise indicated.

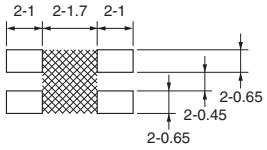




Diagonal lines in the above drawings indicate Au plating.

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

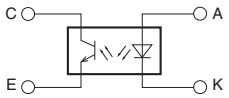
Recommended soldering pattern



Note 1. The shaded portion in the above figure may cause shorting. Do not wire in this portion.

2. The tolerance for the recommended soldering pattern is ±0.1mm

Internal Circuit



Unless otherwise specified, the tolerances are ±0.15 mm.

No burr dimensions are included in the outline dimensions. The burr dimensions are 0.15 mm max.

■ Features

- Ultra-compact model.
- PCB surface mounting type.
- High S/N ratio (High light current / Low leakage current).

■ 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}	500 mA (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	50 mW (see note 1)
Ambient temperature	Operating	T_{opr}	–25°C to 85°C
	Storage	T_{stg}	–40°C to 100°C
	Max. Reflow soldering	T_{sol}	240°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 max. with a frequency of 100Hz

3. Complete reflow soldering within 10 seconds. For reflow soldering, use the conditions given in the Precautions section of this datasheet.

■ Ordering Information

Description	Model
Photomicrosensor (reflective)	**EE-SY1200**

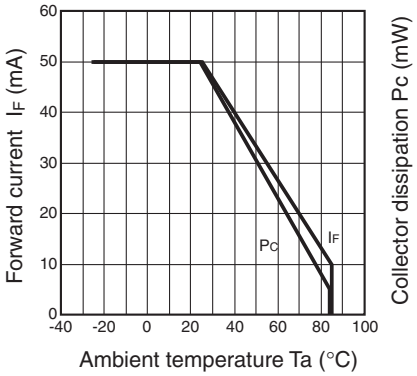
■ Electrical and Optical Characteristics (Ta = 25°C)

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	10 μA max.	V_R = 4 V
	Peak emission wavelength	λ_P	940 nm typ.	---
Detector	Light current 1	I_{L1}	200 μA min. to 1,000 μA max.	Aluminum-deposited surface, I_F = 10 mA, V_{CE} = 2 V, d = 4 mm (see note)
	Light current 2	I_{L2}	150 μA min.	Aluminum-deposited surface, I_F = 4 mA, V_{CE} = 2 V, d = 1 mm (see note)
	Dark current	I_D	2 nA typ., 200 nA max.	V_{CE} = 10 V, 0 ℓx
	Leakage current 1	I_{LEAK1}	500 nA max.	I_F = 10 mA, V_{CE} = 2 V, with no reflection
	Leakage current 2	I_{LEAK2}	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	850 nm typ.	---
Rising time		tr	30 μs typ.	V_{CC} = 2 V, R_L = 1 kΩ, I_L = 100 μA, d = 1 mm (see note)
Falling time		tf	30 μs typ.	

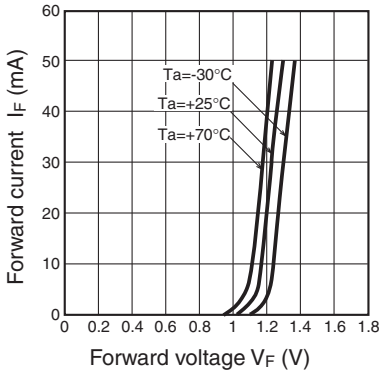
Note: The letter “d” indicates the distance between the top surface of the sensor and the sensing object. Refer to the “Light Current Measurement Setup Diagram” in the Engineering Data section of this datasheet, regarding distance “d”.

■ Engineering Data

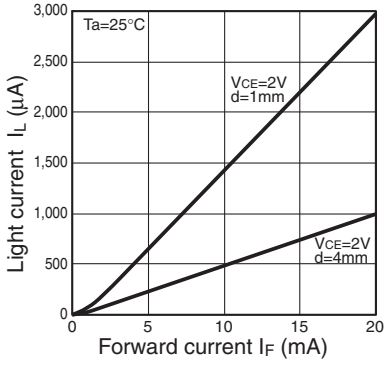
Forward Current vs. Collector Dissipation Temperature Rating



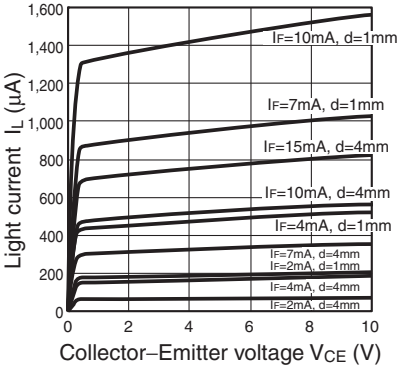
Forward Current vs. Forward Voltage Characteristics (Typical)



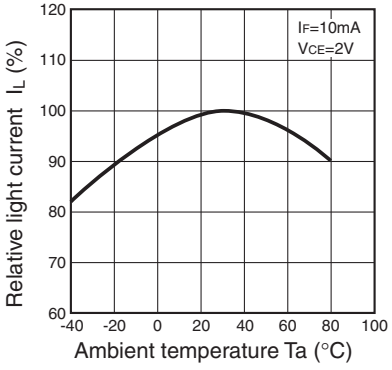
Light Current vs. Forward Current Characteristics (Typical)



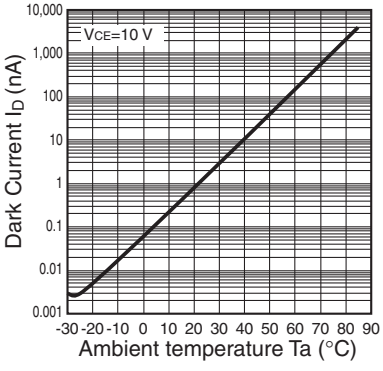
Light Current vs. Collector–Emitter Voltage Characteristics (Typical)



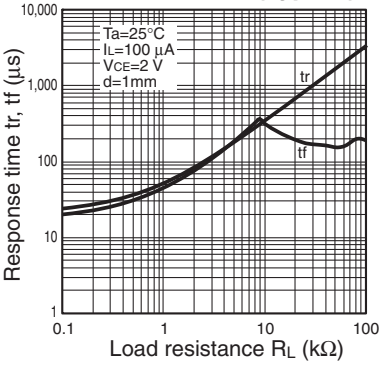
Relative Light Current vs. Ambient Temperature Characteristics (Typical)



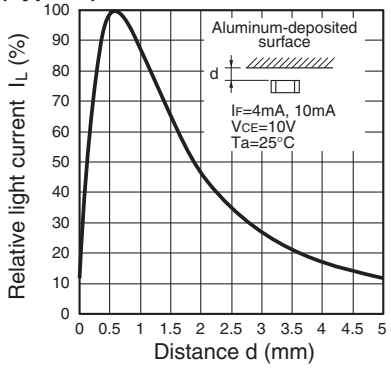
Dark Current vs. Ambient Temperature Characteristics (Typical)



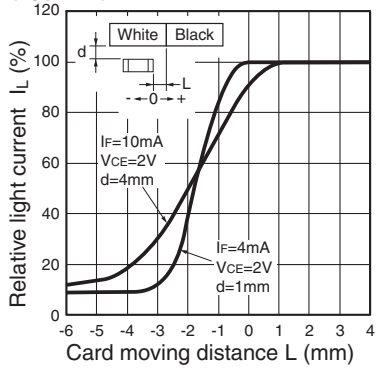
Response Time vs. Load Resistance Characteristics (Typical)



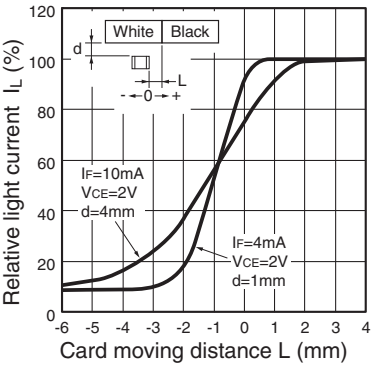
Sensing Distance Characteristics (Typical)



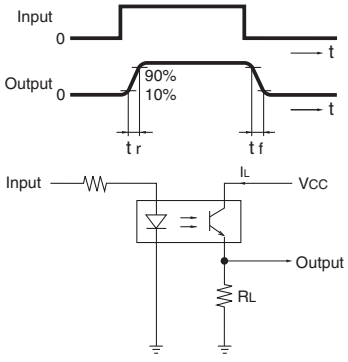
Sensing Position Characteristics (Typical)



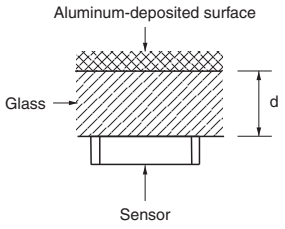
Sensing Position Characteristics (Typical)



Response Time Measurement Circuit



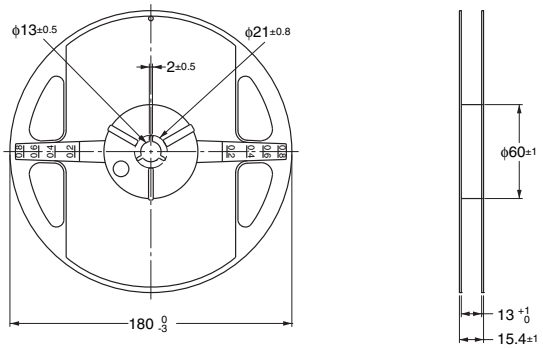
Light Current Measurement Setup Diagram



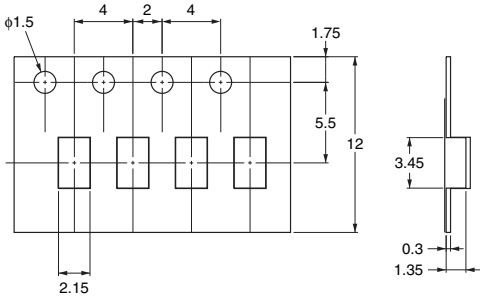
Unit: mm

■ Tape and Reel

Reel

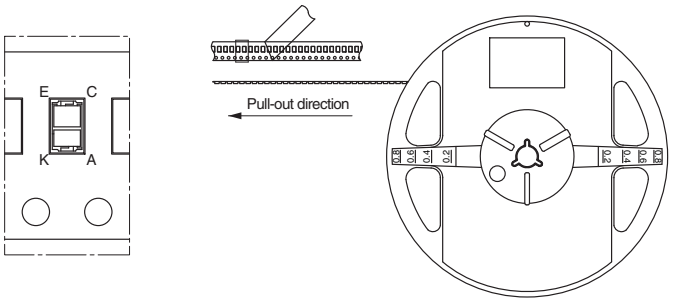


Tape



Tape configuration

The devices are oriented in the tape carrier so that the emitters are positioned closest to the carrier holes.



Tape quantity / packaging

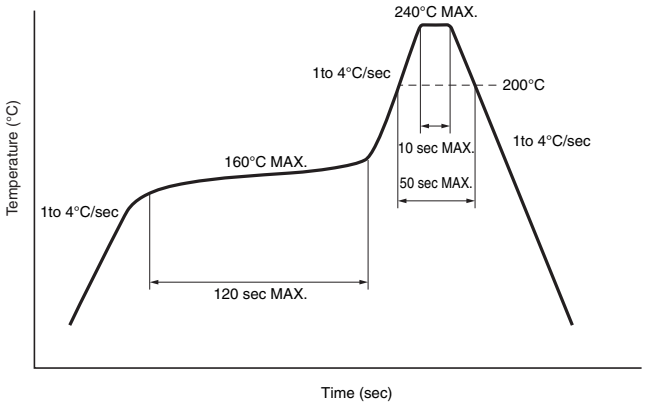
2,000 pcs./reel.

Precautions

■ Soldering Information

Reflow soldering

- Reflow no more than twice. Ensure that all temperatures are within those shown in the diagram, below.
- 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.
- Adjust the amount of applied solder quantity to the product sidewall of the terminal
- When designing the pcb, avoid placing traces or other connections under the sensor, as shown in the 'Recommend Solder Pattern' diagram
- Do not solder manually, to avoid deformation of the housing and/or removal of the Au plating.



- Do not immerse the resin part of the sensor into the solder.
- The use of an infrared lamp can cause the temperature of the resin to rise too high.
- Even if the above temperature profile is met, there is a possibility that the gold wire in the product will be broken, if deformation of the PCB produces external stress to the sensor.
- Test the soldering method under actual conditions and make sure that the process is acceptable, because the impact on the junction between the device and the PCB varies depending upon the soldering and cooling conditions.

Storage

In order to avoid the absorption of moisture, store the product in a dry-box with desiccant or under the following conditions:

Temperature: 5 to 30°C

Humidity: 70%RH max.

To protect the product from the effects of humidity until the package is opened, dry-box storage is recommended.

Reflow soldering must be done within 48 hours after opening the package, during which time the product must be stored between 5°C and 25°C at 60%RH.

If it is necessary to store the product for more than 48 hours after opening the bag, use dry-box storage or reseal the products in a moisture-proof bag with a commercially available desiccant. Then, store the sensors between 5 to 30°C at 70% max. humidity, mounting them within 1 week.

Baking

If the above storage conditions cannot be met or if more than 48 hours have lapsed since the package was opened, then bake the product under the following conditions before use:

60°C, 12 to 24 hours (max.) for sensors on a reel

100°C, 8 to 24 hours (max.) for loose sensors

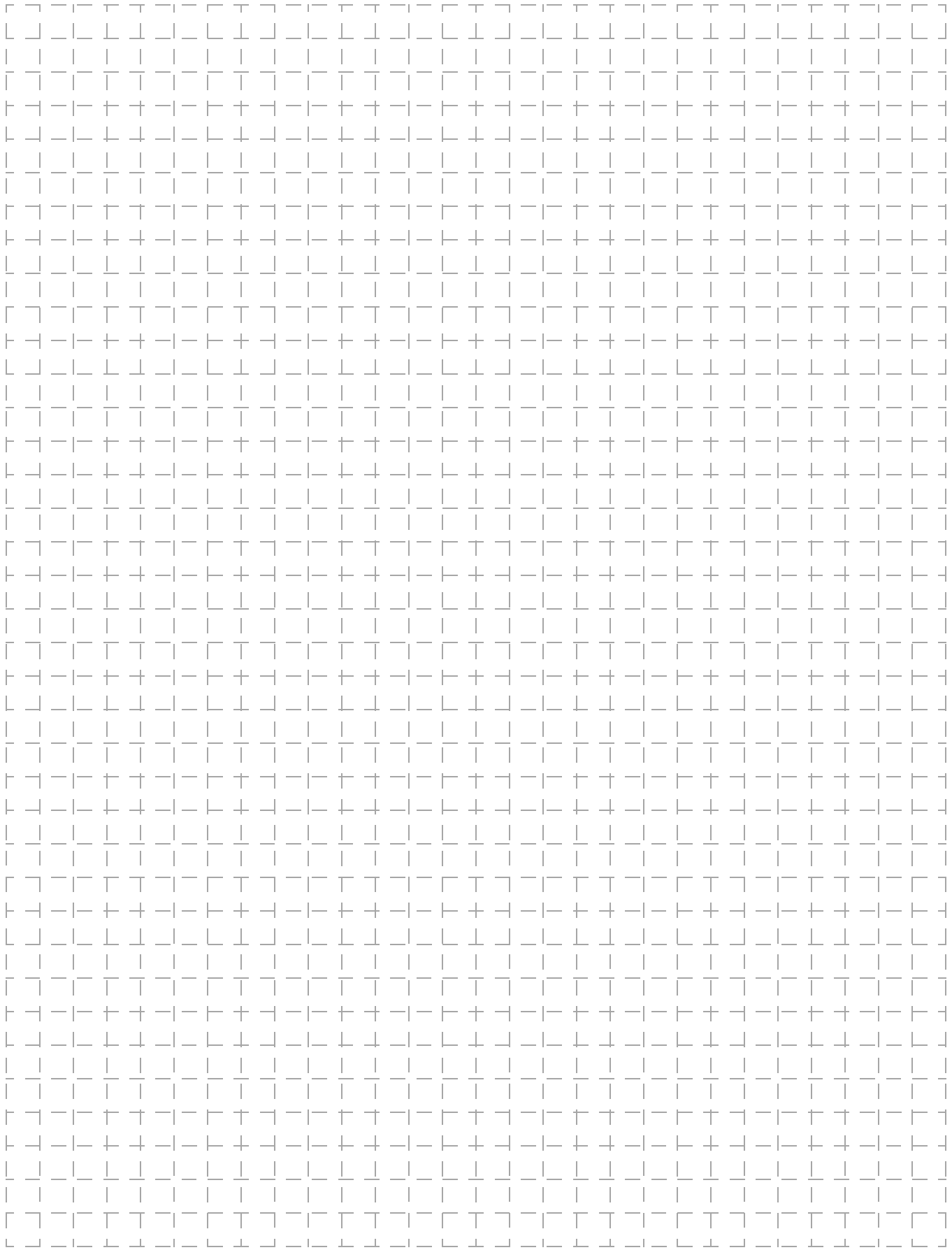
Note: Do not bake the sensors while they are still in their packaging. Place loose sensors in metal trays prior to baking. Subject the sensors to the baking process no more than once.

■ External Light Interferance

Depending upon the installed conditions of the Photomicrosensor, the detector may receive the sensor's LED light and/or external light which is reflected from the surrounding of the Photomicrosensor and/or the background object.

Please confirm the condition and suitability of the Photomicrosensor within the actual application and end product prior to mass production.

MEMO



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