

Photomicrosensor (Reflective)

EE-SY1200

Ultra-Compact Reflective/SMD Type (Standard Sensing Distance = 1 to 4 mm)

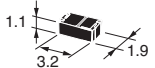

- 1.9 × 3.2 mm ultra-compact type
- PCB surface mounting type.



 Be sure to read *Safety Precautions* on Page 3.

Ordering Information

Photomicrosensor

Appearance	Sensing method	Connecting method	Standard sensing distance	Output type	Model	Minimum packing unit (Unit: pcs)
	Reflective	SMT	 1 to 4 mm	Phototransistor	EE-SY1200*	2000*

Note: Order in multiples of minimum packing unit. * Types with 100 pcs./box are available. The model name for ordering is EE-SY1200-1.

Ratings, Characteristics and Exterior Specifications

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rated value	Unit
Emitter			
Forward current	I_F	50*1	mA
Pulse forward current	I_{FP}	500*2	mA
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*1	mW
Operating temperature	T_{opr}	-25 to 85	°C
Storage temperature	T_{stg}	-40 to 100	°C
Reflow soldering temperature	T_{sol}	240*3	°C

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

*2. Pulse width ≤ 10 μs, Repeated 100 Hz

*3. Complete soldering within 10 seconds.

Exterior Specifications

Connecting method	Weight (g)	Material	
		Case	Sealing resin
SMT	0.02	LCP	Epoxy resin

Electrical and Optical Characteristics (Ta = 25°C)

Item	Symbol	Value			Unit	Condition
		MIN.	TYP.	MAX.		
Emitter						
Forward voltage	V_F	—	1.2	1.4	V	$I_F = 20$ mA
Reverse current	I_R	—	—	10	μA	$V_R = 4$ V
Peak emission wavelength	λ_P	—	940	—	nm	—
Detector						
Light current 1	I_{L1}	200	—	1000	μA	$I_F = 10$ mA, $V_{CE} = 2$ V, aluminum vapor deposition glass, $d = 4$ mm*1
Light current 2	I_{L2}	150	—	—	μA	$I_F = 4$ mA, $V_{CE} = 2$ V, aluminum vapor deposition glass, $d = 1$ mm*1
Dark current	I_D	—	2	200	nA	$V_{CE} = 10$ V, 0 lx
Leakage current 1	I_{LEAK1}	—	—	500	nA	$I_F = 10$ mA, $V_{CE} = 2$ V, Non-reflective state*2
Leakage current 2	I_{LEAK2}	—	—	200	nA	$I_F = 4$ mA, $V_{CE} = 2$ V, Non-reflective state*2
Collector-Emitter saturated voltage	$V_{CE(sat)}$	—	—	—	V	—
Peak spectral sensitivity wavelength	λ_P	—	850	—	nm	—
Rising time	t_r	—	30	—	μs	$V_{CC} = 2$ V, $R_L = 1$ kΩ, $I_L = 100$ μA, $d = 1$ mm*1
Falling time	t_f	—	30	—	μs	$V_{CC} = 2$ V, $R_L = 1$ kΩ, $I_L = 100$ μA, $d = 1$ mm*1

*1. "d" is the distance from the top of the sensor to the reflective surface.

*2. Depending on the placement of the sensor, there is a possibility that LED light emitted from the sensor or ambient light will be reflected off objects in the periphery or objects behind the object being sensed and enter the receiving side. Due to this, usage should take place only after sufficiently confirming that the application is one which can actually be used.

Engineering Data (Reference Value)

Fig 1. Forward Current vs. Temperature Ratings for Permissible Dissipation

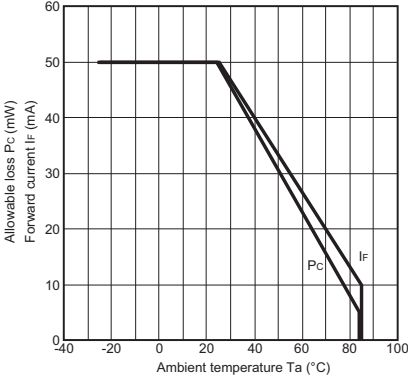


Fig 2. Forward Current vs. Forward Voltage Characteristics (Typical)

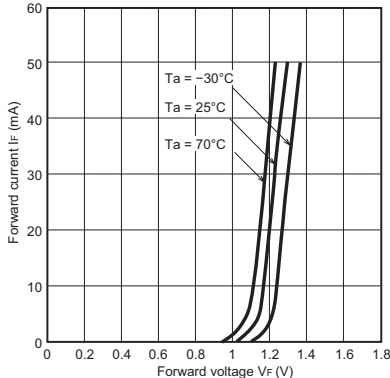


Fig 3. Light Current vs. Forward Current Characteristics (Typical)

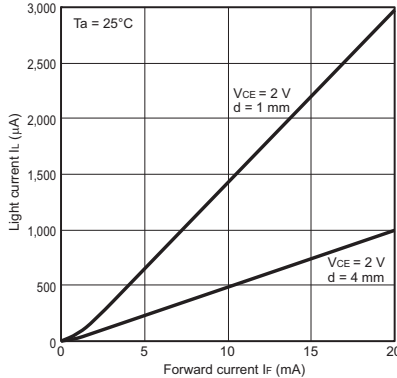


Fig 4. Light Current vs. Collector-Emitter Voltage Characteristics (Typical)

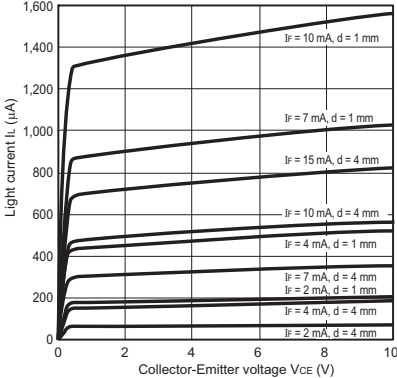


Fig 5. Relative Light Current vs. Ambient Temperature Characteristics (Typical)

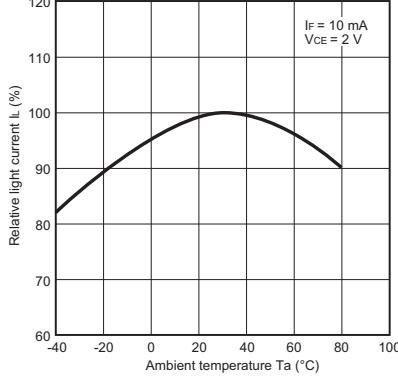


Fig 6. Dark Current vs. Ambient Temperature Characteristics (Typical)

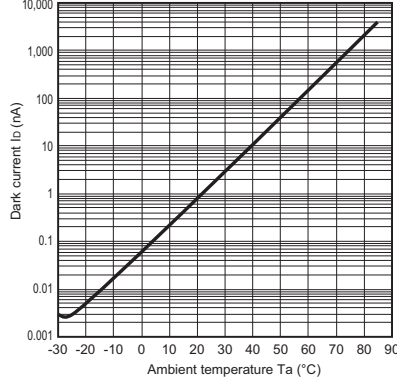


Fig 7. Response Time vs. Load Resistance Characteristics (Typical)

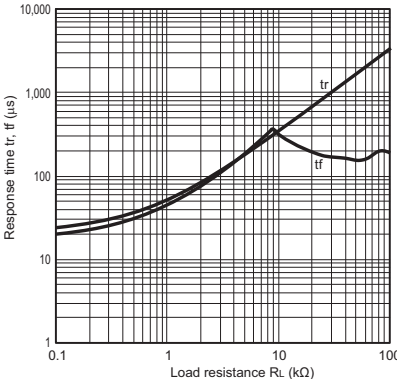


Fig 8. Relative Light Current vs. Distance Characteristics (Typical)

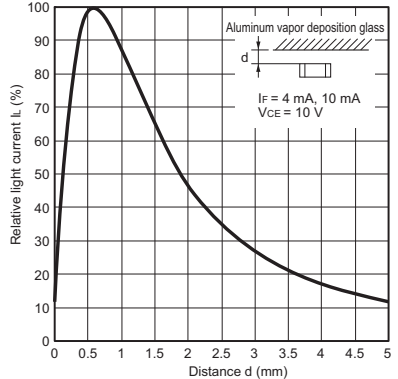


Fig 9. Relative Light Current vs. Card Movement Distance Characteristics (Typical)

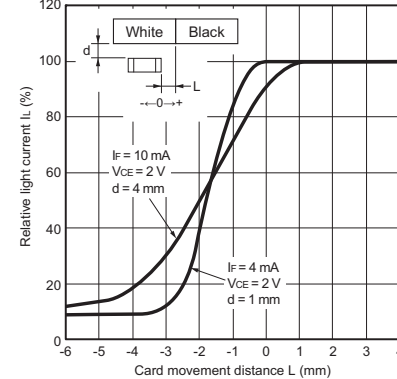


Fig 10. Relative Light Current vs. Card Movement Distance Characteristics (Typical)

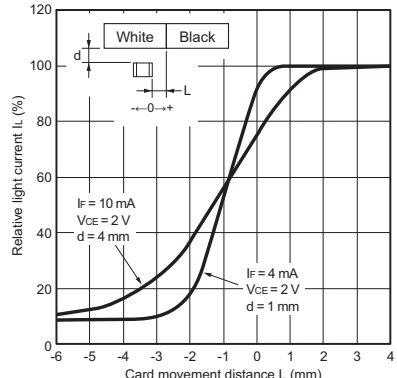


Fig 11. Response Time Measurement Circuit

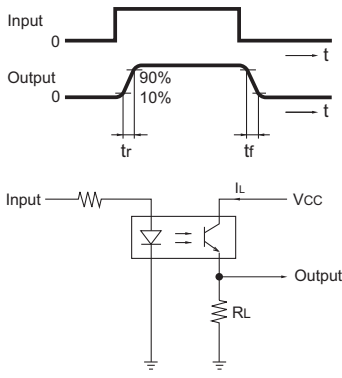
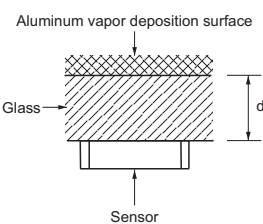


Fig 12. Light Current Measurement Layout Diagram



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 Correct Use

Do not use the product in atmospheres or environments that exceed product ratings. This product is for surface mounting. Refer to Soldering Information, Storage and Baking for details. Dispose of this product as industrial waste.

Precautions for Safe Use

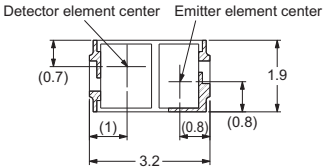
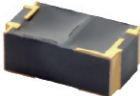
Do not use the product with a voltage or current that exceeds the rated range. Applying a voltage or current that is higher than the rated range may result in explosion or fire. Do not miswire such as the polarity of the power supply voltage. Otherwise the product may be damaged or it may burn. This product does not resist water. Do not use the product in places where water or oil may be sprayed onto the product.

Dimensions and Internal Circuit

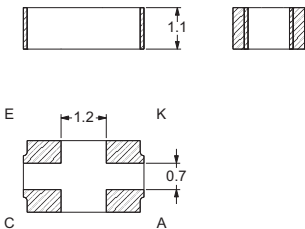
(Unit: mm)

Photomicrosensor

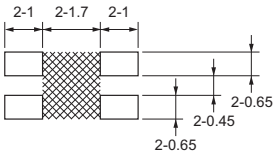
EE-SY1200



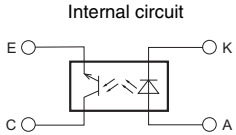
Unless otherwise specified, the tolerances are ± 0.15 mm. This does not include burrs. Burr dimensions are max. 0.15. The hatched area is metal plated.



Recommended soldering pattern



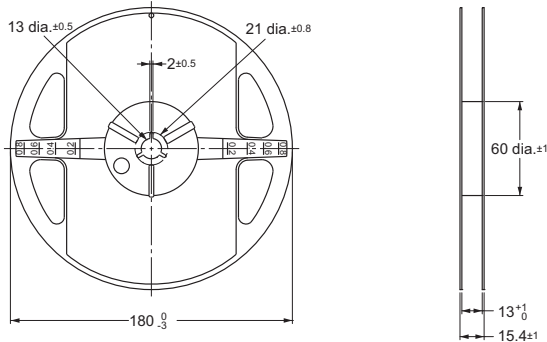
- Note: 1. As the shaded area above is a cause of short-circuiting, do not perform wiring there.
2. The dimensional tolerance for the recommended soldering pattern is ± 0.1 .



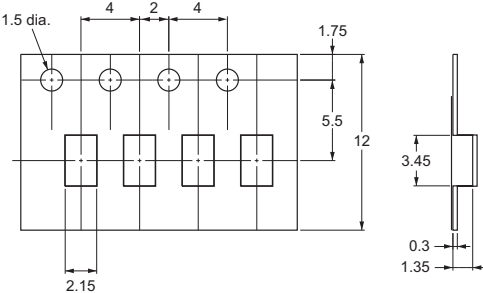
Terminal No.	Name
A	Anode
K	Cathode
C	Collector
E	Emitter

Tape and Reel

Reel (Unit: mm)

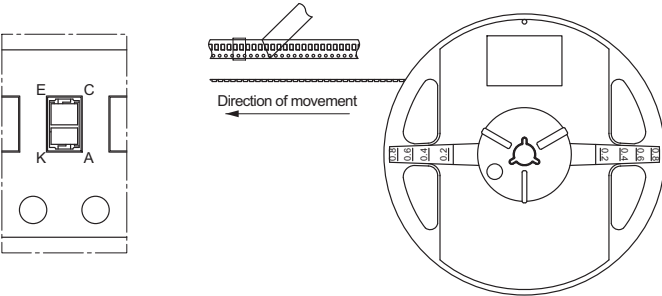


Tape (Unit: mm)



Taping Direction

- The sensor located inside the square hole of the carrier tape shall be oriented towards the side of the round hole on the feed side in which the sensor's light emitting diode is located.



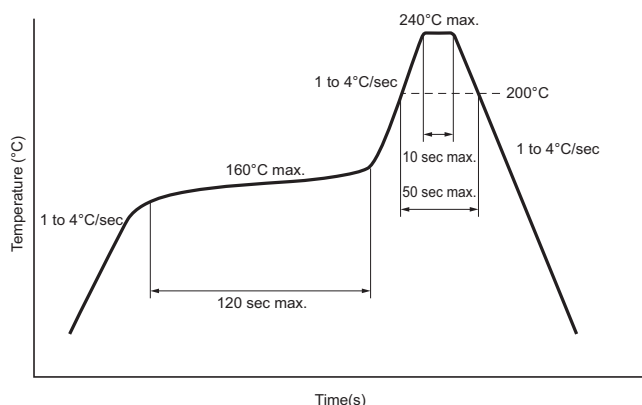
Tape Quantity

- 2,000 pcs./reel (EE-SY1200)
- 100 pcs./reel (EE-SY1200-1)

Soldering Information

Temperature Profile

The reflow soldering can be implemented in two times complying with the following diagram. All the temperatures in the product must be within the diagram.



Manual Soldering

The manual soldering should not be applied to the products, otherwise the housing may be deformed and/or the Au plating may be peeled off by heat.

Other Notes

The use of infrared lamp causes the temperature at the resin to rise particularly too high.

All the temperatures in the product must be within the above diagram. Do not immerse the resin part into the solder.

Even if within the above temperature diagram, there is a possibility that the gold wire in the products is broken in case that the deformation of PC board gives stress to the products. Please confirm the conditions of the reflow soldering fully by actual solder reflow machine prior to the mass production use.

Storage and Treatment after Open

Storage Conditions

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.

Treatment after Open

1. Reflow soldering must be done within 48 hours stored at the conditions of humidity 60% or less and temperature 5 to 25°C.
2. If the product must be stored after it is unpacked, store it in a dry box or reseal it in a moisture-proof package with desiccant at a temperature of 5 to 30°C and a humidity of 70% or less. Even then, mount the product within one week.

Baking Treatment

In case that it could not carry out the above treatment, it is able to mount by the following baking treatment.

However baking treatment shall be limited only 1 time.

Recommended conditions: 60°C for 12 to 24 hours (reeled one)

100°C for 8 to 24 hours (loose one)

Please check each region's Terms & Conditions by region website.

OMRON Corporation

Device & Module Solutions Company

Regional Contact

Americas

<https://components.omron.com/us>

Asia-Pacific

<https://components.omron.com/ap>

Korea

<https://components.omron.com/kr>

Europe

<https://components.omron.com/eu>

China

<https://components.omron.com.cn>

Japan

<https://components.omron.com/jp>