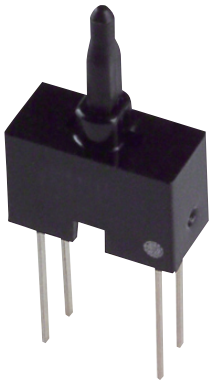
Photomicrosensor (Actuator)
EE-SA105

Actuator

• Low operating force (0.15 N)

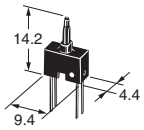


⚠ **Be sure to read *Safety Precautions* on Page 3.**

RoHS Compliant

Ordering Information

Photomicrosensor

Appearance	Sensing method	Connecting method	Sensing distance	Output type	Model	Minimum packing unit (Unit: pcs)
	Transmissive	Terminal for PCB mounting	Refer to Mechanical Characteristics	Phototransistor	**EE-SA105**	1

Note: Order in multiples of minimum packing unit.

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}	1*2	A
	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	100*1	mW
Operating temperature		T_{opr}	-25 to 70	°C
Storage temperature		T_{stg}	-40 to 100	°C
Soldering temperature		T_{sol}	260*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	Actuator
Terminal for PCB mounting	0.3	Polycarbonate	POM

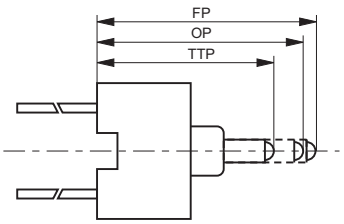
Electrical and Optical Characteristics (Ta = 25°C)

Item		Symbol	Value			Unit	Condition
			MIN.	TYP.	MAX.		
Emitter							
	Forward voltage	V_F	—	1.2	1.5	V	I_F = 30 mA
	Reverse current	I_R	—	0.01	10	µA	V_R = 4 V
	Peak emission wavelength	λ_P	—	940	—	nm	I_F = 20 mA
Detector							
	Light current	I_L	0.5	—	—	mA	I_F = 20 mA, V_{CE} = 5 V at free position (FP)
	Dark current	I_D	—	2	200	nA	V_{CE} = 10 V, 0 lx
	Leakage current	I_{LEAK}	—	—	10	µA	I_F = 20 mA, V_{CE} = 5 V at operating position (OP)
	Collector-Emitter saturated voltage	V_{CE} (sat)	—	0.15	0.4	V	I_F = 20 mA, I_L = 0.1 mA
	Peak spectral sensitivity wavelength	λ_P	—	850	—	nm	V_{CE} = 10 V
Rising time		tr	—	—	—	µs	—
Falling time		tf	—	—	—	µs	—

Mechanical Characteristics

Item	Value		
Operating specifications	Free position (FP)	14.2±0.3 mm	I_F = 20 mA, V_{CE} = 5 V*1
	Operating position (OP)	13 mm min.	
	Total travel position (TTP)	12.1 mm max.	
Operating force	0.15 N max.*2		
Mechanical life expectancy	500,000 operations min. (The actuator traveling from its FP to FP via TTP is regarded as one operation.)		

*1. Free position (FP): The distance between the bottom of the housing to the top of the actuator without any external force imposed on the actuator.
Operating position (OP): The distance between the bottom of the housing to the top of the actuator when the actuator is pressed and the I_L becomes I_{LEAK} or less.
Total travel position (TTP): The distance between the bottom of the housing to the top of the actuator when the actuator is fully pressed.
*2. Operating force: The force required to press the actuator from its FP to OP.



Engineering Data (Reference Value)

Fig 1. Forward Current vs. Collector Dissipation Temperature Rating

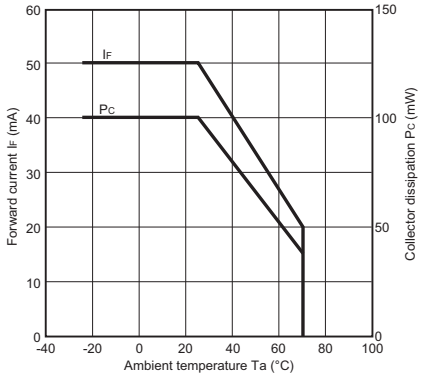


Fig 2. Forward Current vs. Forward Voltage Characteristics (Typical)

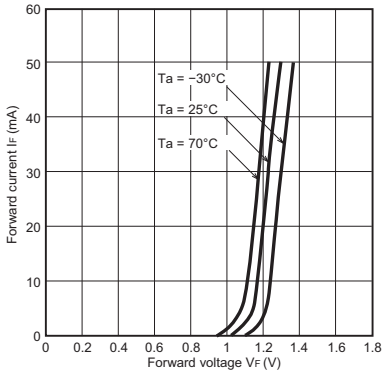


Fig 3. Light Current vs. Forward Current Characteristics (Typical)

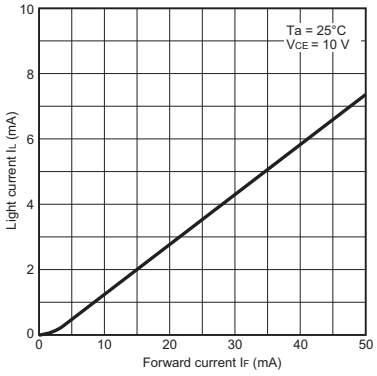


Fig 4. Light Current vs. Collector-Emitter Voltage Characteristics (Typical)

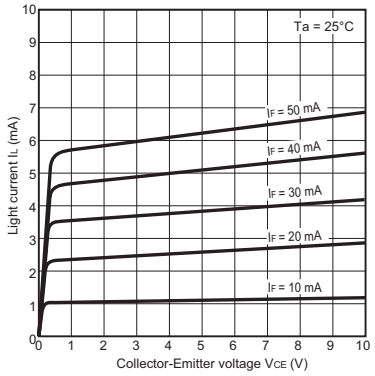


Fig 5. Relative Light Current vs. Ambient Temperature Characteristics (Typical)

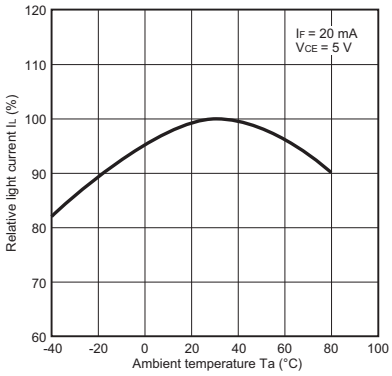


Fig 6. Dark Current vs. Ambient Temperature Characteristics (Typical)

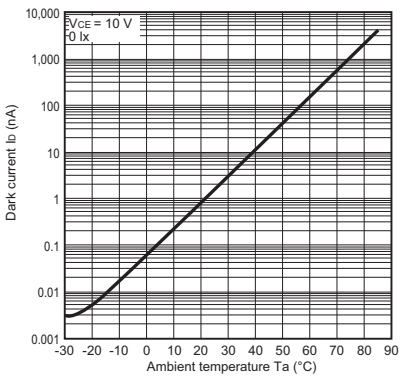
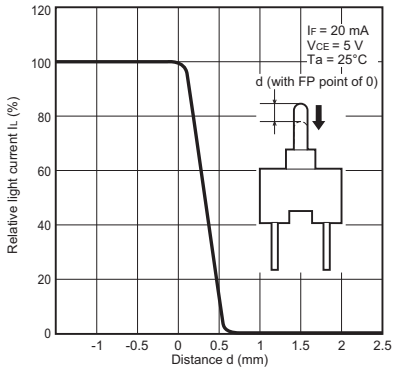


Fig 7. Sensing Position Characteristics (Typical)



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.

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.

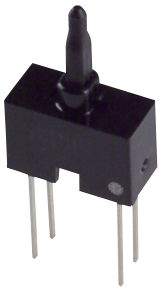
This product does not resist water. Do not use the product in places where water or oil may be sprayed onto the product.

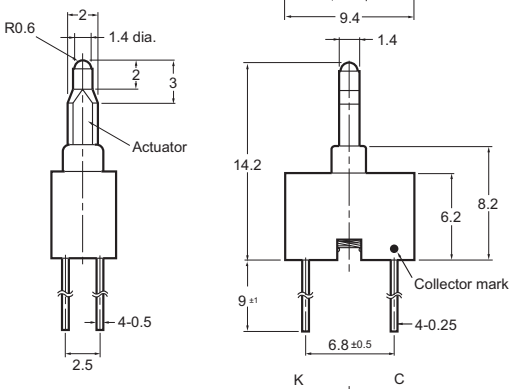
Dimensions and Internal Circuit

(Unit: mm)

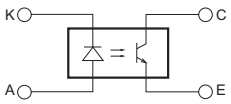
Photomicrosensor

EE-SA105





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

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