

Reflective/Terminal Type with Visible Light Cut Filter (Standard Sensing Distance = 5 mm)

- Dust resistant structure
- Includes screw mounting holes (M2)
- Two types of terminals (terminal for cord soldering, terminal for PCB mounting)



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	Terminal for cord soldering	5 mm	Phototransistor	EE-SF5	1
		Terminal for PCB mounting			EE-SF5-B	

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}	—	V
Collector current	I _C	20	mA
Collector dissipation	P _C	100*3	mW
Operating temperature	T _{opr}	-25 to 80	°C
Storage temperature	T _{stg}	-30 to 80	°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
Terminal for cord soldering	0.7	Polycarbonate
Terminal for PCB mounting		

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	200	—	2000	μA	I _F = 20 mA, V _{CE} = 10 V, Reflectance 90% White paper d = 5 mm*
Dark current	I _D	—	2	200	nA	V _{CE} = 10 V, 0 lx
Leakage current	I _{LEAK}	—	—	2	μA	I _F = 20 mA, V _{CE} = 10 V, Non-reflective state
Collector-Emitter saturated voltage	V _{CE (sat)}	—	—	—	V	—
Peak spectral sensitivity wavelength	λ _P	—	850	—	nm	V _{CE} = 10 V
Rising time	t _r	—	30	—	μs	V _{CC} = 5 V, R _L = 1 kΩ, I _L = 1 mA
Falling time	t _f	—	30	—	μs	V _{CC} = 5 V, R _L = 1 kΩ, I _L = 1 mA

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

Engineering Data (Reference Value)

Fig 1. Forward Current vs. Collector Dissipation Temperature Rating

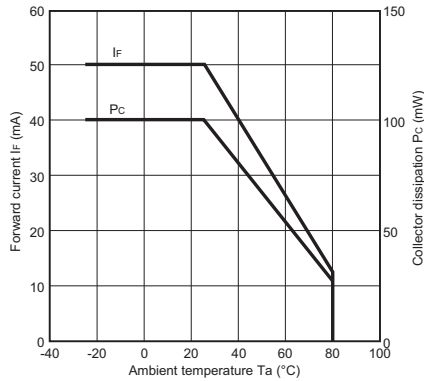


Fig 2. Light Current vs. Forward Current Characteristics (Typical)

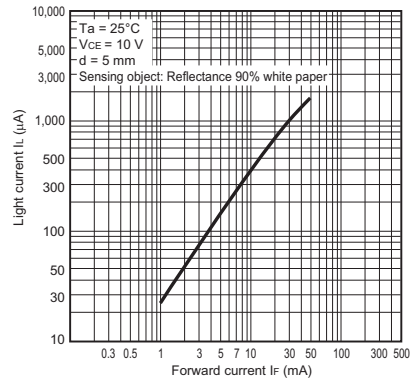


Fig 3. Light Current vs. Collector-Emitter Voltage Characteristics (Typical)

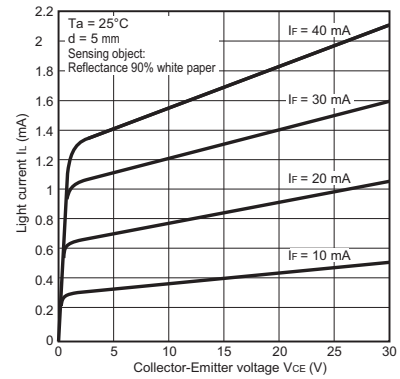


Fig 4. Relative Light Current vs. Ambient Temperature Characteristics (Typical)

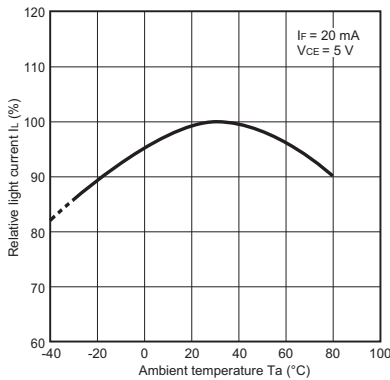


Fig 5. Dark Current vs. Ambient Temperature Characteristics (Typical)

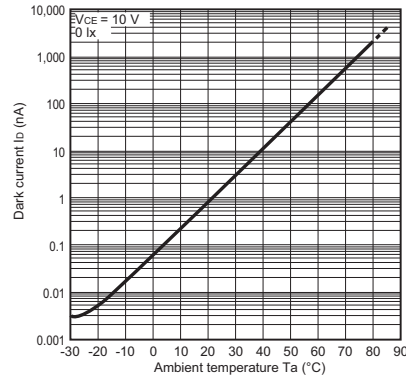


Fig 6. Response Time vs. Load Resistance Characteristics (Typical)

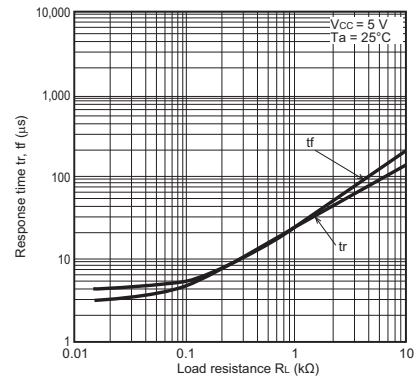


Fig 7. Sensing Distance Characteristics (Typical)

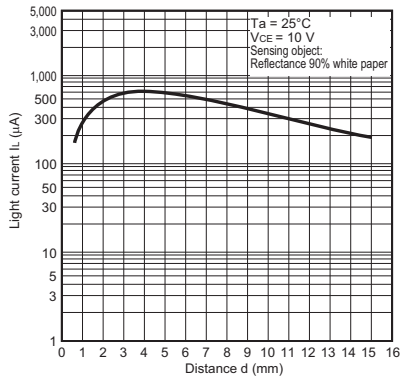


Fig 8. Sensing Position Characteristics (Typical)

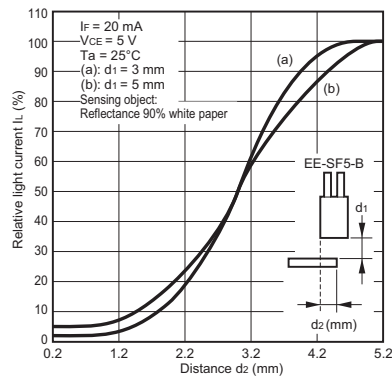


Fig 9. Sensing Position Characteristics (Typical)

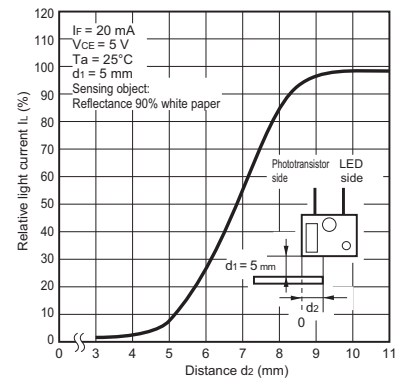


Fig 10. Sensing Angle Characteristics (Typical)

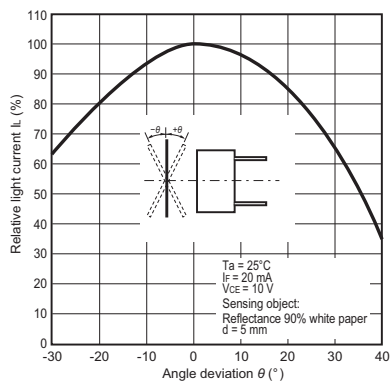


Fig 11. Sensing Angle Characteristics (Typical)

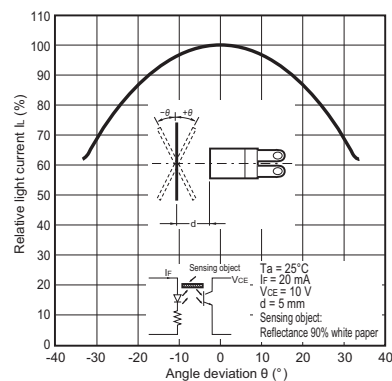
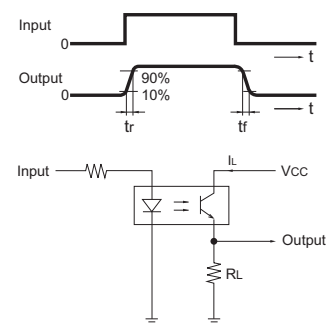


Fig 12. Response Time Measurement Circuit



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.

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.

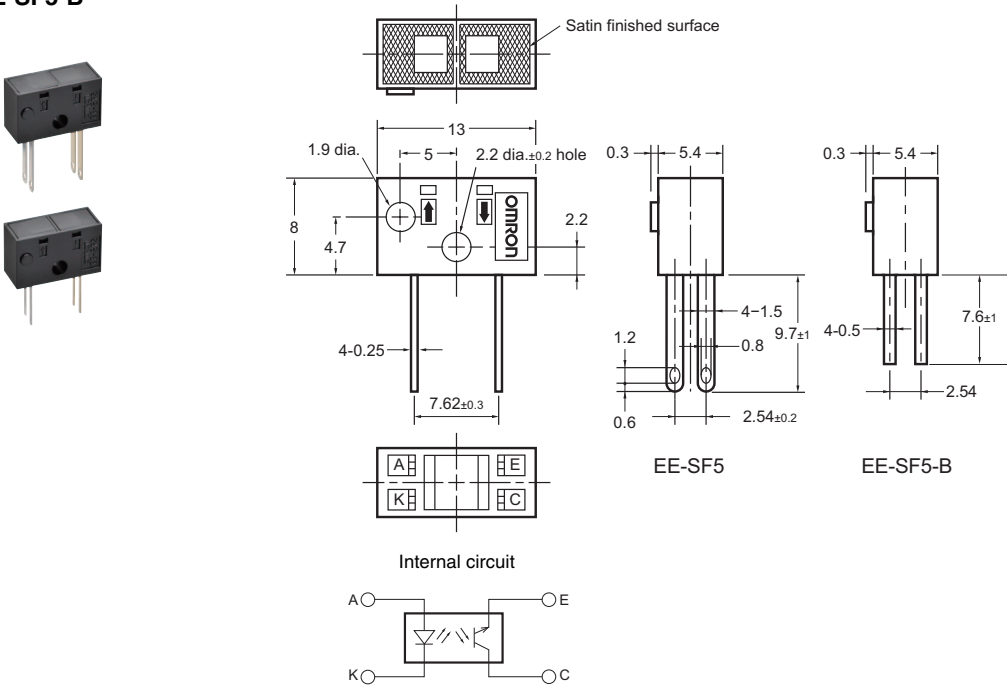
This product does not resist water. Do not use the product in places where water or oil may be sprayed onto the product.

Dimensions and Internal Circuit

(Unit: mm)

Photomicrosensor

EE-SF5
EE-SF5-B



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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