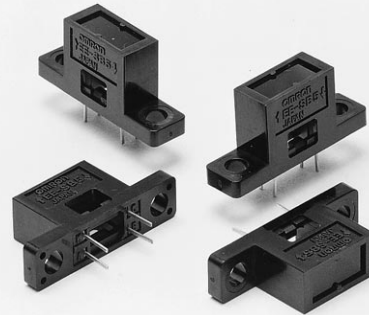
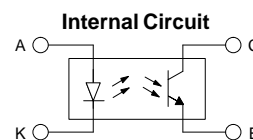
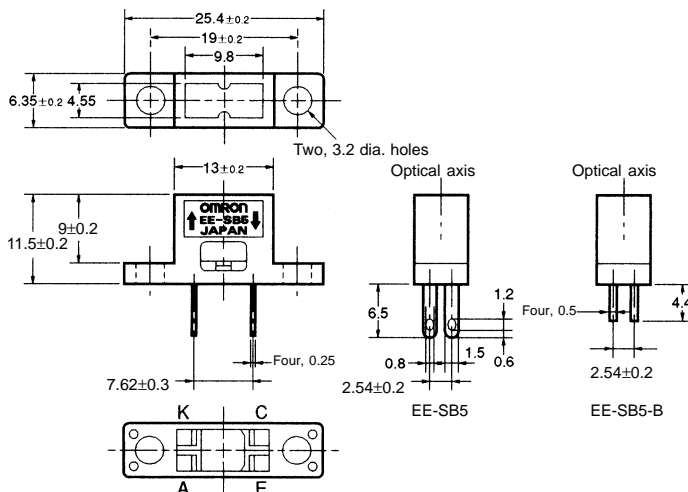


### Reflective

- Phototransistor output.
- Sensing distance 5mm.
- Dust-tight construction.
- With a visible-light intercepting filter which allows objects to be sensed without being greatly influenced by the light radiated from fluorescent lamps.
- Mounted with M3 screws.
- Model with soldering terminals (EE-SB5).
- Model with PCB terminals (EE-SB5-B).



### Dimensions



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

### Specifications

#### Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rated value	
Emitter	Forward current	I <sub>F</sub>	50 mA (see note 1)
	Pulse forward current	I <sub>FP</sub>	1 A (see note 2)
	Reverse voltage	V <sub>R</sub>	4 V
Detector	Collector-Emitter voltage	V <sub>CEO</sub>	30 V
	Emitter-Collector voltage	V <sub>ECO</sub>	---
	Collector current	I <sub>C</sub>	20 mA
	Collector dissipation	P <sub>C</sub>	100 mW (see note 1)
Ambient temperature	Operating	T <sub>opr</sub>	-25°C to 80°C
	Storage	T <sub>stg</sub>	-30°C to 80°C
	Soldering	T <sub>sol</sub>	260°C

- 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.

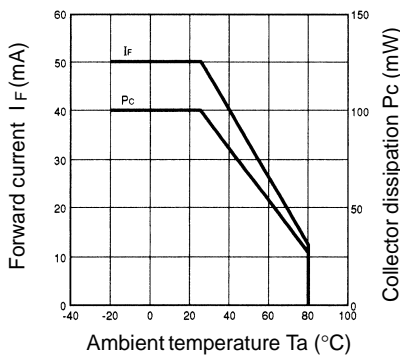
## ■ Electrical and Optical Characteristics (Ta = 25°C)

Item		Symbol	Value	Condition
Emitter	Forward voltage	$V_F$	1.2 V typ., 1.5 V max.	$I_F = 30$ mA
	Reverse current	$I_R$	0.01 $\mu$ A typ., 10 $\mu$ A max.	$V_R = 4$ V
	Peak emission wavelength	$\lambda_P$	940 nm typ.	$I_F = 20$ mA
Detector	Light current	$I_L$	200 $\mu$ A min., 2,000 $\mu$ A max.	$I_F = 20$ mA, $V_{CE} = 10$ V White paper with a reflection ratio of 90%, $d = 5$ mm (see note)
	Dark current	$I_D$	2 nA typ., 200 nA max.	$V_{CE} = 10$ V, 0 lx
	Leakage current	$I_{LEAK}$	2 $\mu$ A max.	$I_F = 20$ mA, $V_{CE} = 10$ V with no reflection
	Collector–Emitter saturated voltage	$V_{CE}(\text{sat})$	---	---
	Peak spectral sensitivity wavelength	$\lambda_P$	850 nm typ.	$V_{CE} = 10$ V
Rising time		$t_r$	30 $\mu$ s typ.	$V_{CC} = 5$ V, $R_L = 1$ k $\Omega$ , $I_L = 1$ mA
Falling time		$t_f$	30 $\mu$ s typ.	$V_{CC} = 5$ V, $R_L = 1$ k $\Omega$ , $I_L = 1$ mA

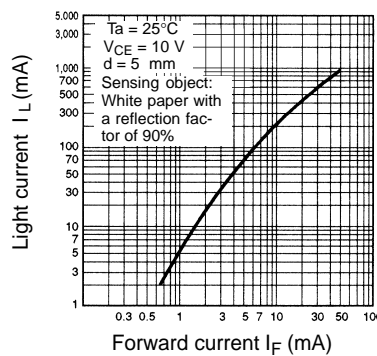
**Note:** The letter "d" indicates the distance between the top surface of the sensor and the sensing object.

## Engineering Data

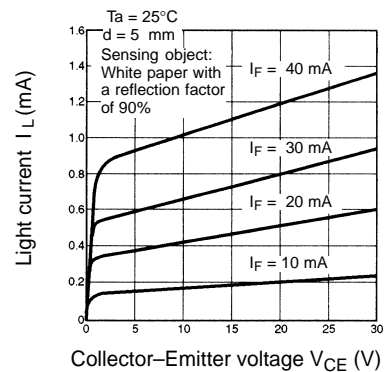
**Forward Current vs. Collector Dissipation Temperature Rating**



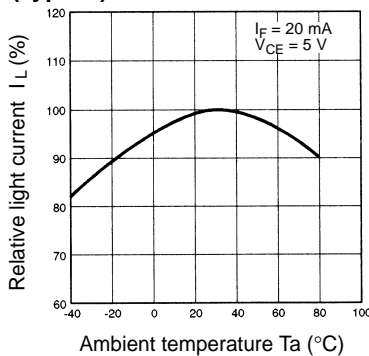
**Light Current vs. Forward Current Characteristics (Typical)**



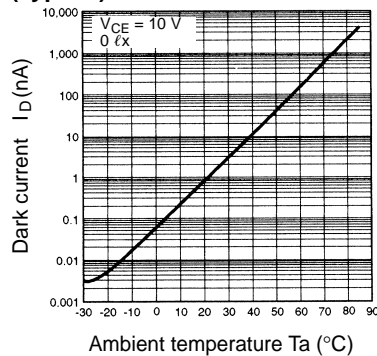
**Light Current vs. Collector–Emitter Voltage Characteristics (Typical)**



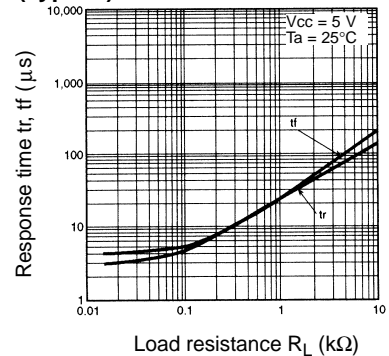
**Relative Light Current vs. Ambient Temperature Characteristics (Typical)**



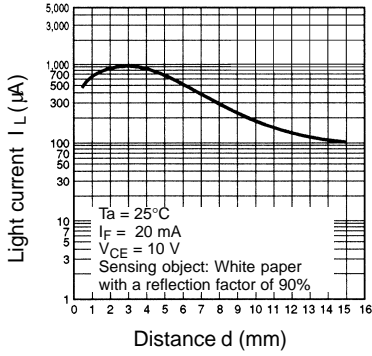
**Dark Current vs. Ambient Temperature Characteristics (Typical)**



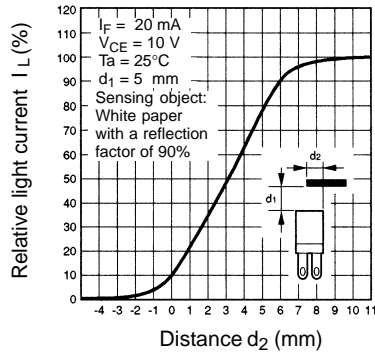
**Response Time vs. Load Resistance Characteristics (Typical)**



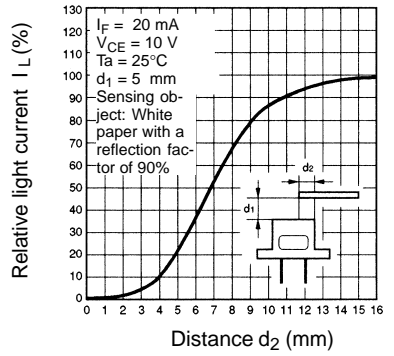
### Sensing Distance Characteristics (Typical)



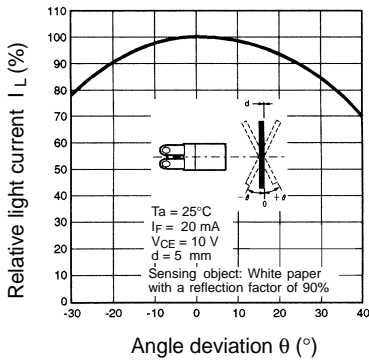
### Sensing Position Characteristics (Typical)



### Sensing Position Characteristics (Typical)



### Sensing Angle Characteristics (Typical)



### Response Time Measurement Circuit

