

EE-SF5/SF5-B

Compact Reflective Phototransistor
Output Insusceptible to External
Interference Light

- Has an infrared filter to reduce the effects of short wavelength light such as that from fluorescent lamp
- Models with soldering terminals (EE-SF5) or PCB terminals (EE-SF5-B)



Ordering Information

Appearance	Sensing method	Sensing distance	Sensing object	Output configuration	Weight	Part number
Soldering terminals 	Reflective	5 mm	White paper with reflection factor of 90%	Phototransistor	Approx. 0.6 g	EE-SF5
PCB terminals 						EE-SF5-B

Specifications

■ ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ (77°F))

Item		Symbol	Rated value
Input	Forward current	I_F	50 mA*
	Pulse forward current	I_{FP}	1 A**
	Reverse voltage	V_R	4 V
Output	Collector-emitter voltage	V_{CEO}	30 V
	Collector current	I_C	20 mA
	Collector dissipation	P_C	100 mW*
Ambient temperature	Operating	T_{opr}	-25°C to 80°C (-13°F to 176°F)
	Storage	T_{stg}	-30°C to 80°C (-22°F to 176°F)

*Refer to Engineering Data if the ambient temperature is not within the normal room temperature range.

**This value was measured with a pulse width of 10 μs and a repeating frequency of 100 Hz.

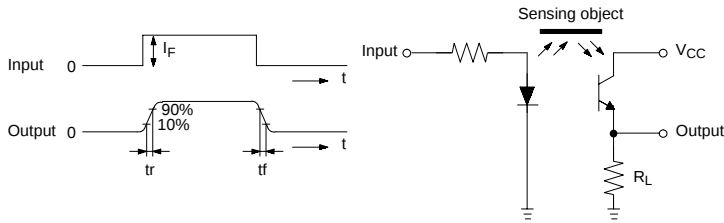
CHARACTERISTICS (T_A = 25°C (77°F))

Item		Symbol	Value	Condition
Emitter	Forward voltage	V _F	1.5 V max.	I _F = 30 mA
	Reverse current	I _R	10 μA max.	V _R = 4 V
	Peak emission wavelength	λ _p (L)	940 nm typ.	I _F = 20 mA
Receiver	Dark current	I _D	200 nA max.	V _{CE} = 10 V 0/x
	Peak spectral sensitivity wavelength	λ _p (P)	850 nm typ.	V _{CE} = 10 V
Combination	Light current	I _L	200 to 2,000 μA	I _F = 20 mA* V _{CE} = 10 V
	Leakage current	I _{LEAK}	2 μA max.	I _F = 20 mA** V _{CE} = 10 V
	Rising time***	t _r	30 μs typ.	V _{CC} = 5 V R _L = 1 kΩ I _L = 1 mA
	Falling time***	t _f	30 μs typ.	

*The sensing object is white paper with a reflection factor of 90% at a sensing distance of 5 mm.

**The sensing object reflects no light.

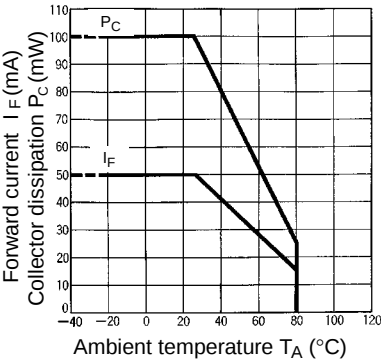
***The following illustrations show the rising time, t_r, and the falling time, t_f.



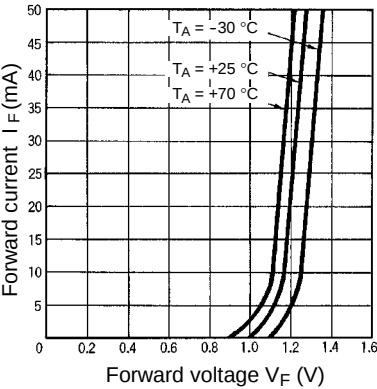
Engineering Data

Note: The operating conditions of the photomicrosensor must be within the absolute maximum rating ranges.

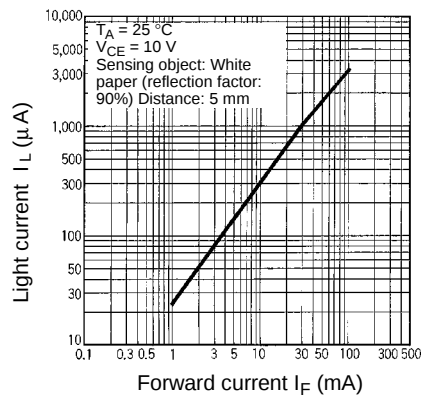
TEMPERATURE CHARACTERISTICS



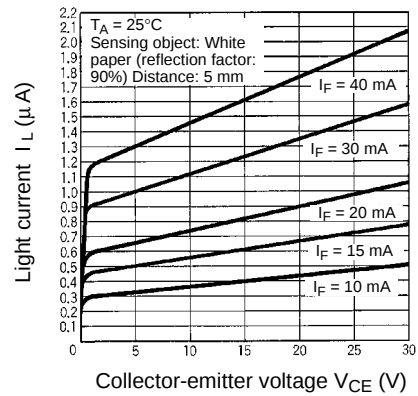
INPUT CHARACTERISTICS (TYPICAL)



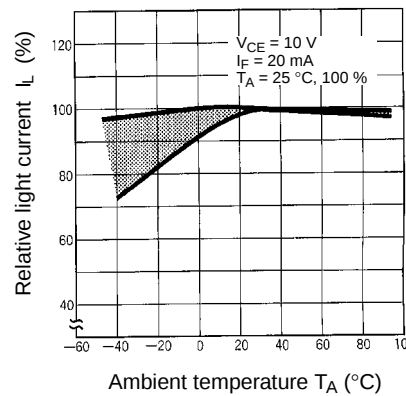
INPUT/OUTPUT CHARACTERISTICS (TYPICAL)



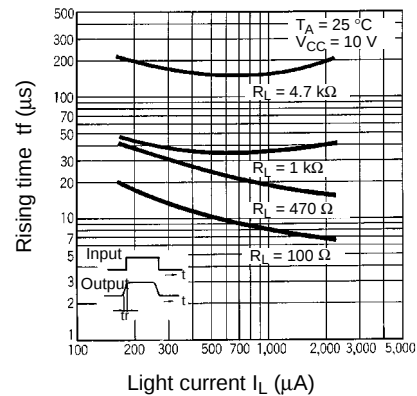
OUTPUT CHARACTERISTICS (TYPICAL)



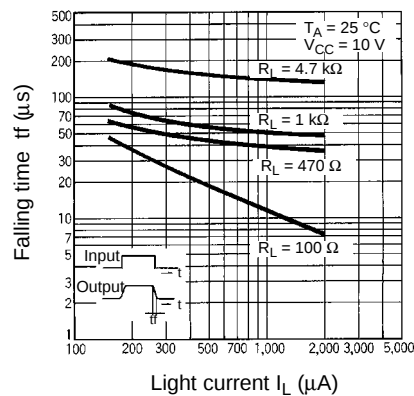
LIGHT CURRENT TEMPERATURE DEPENDENCY (TYPICAL)



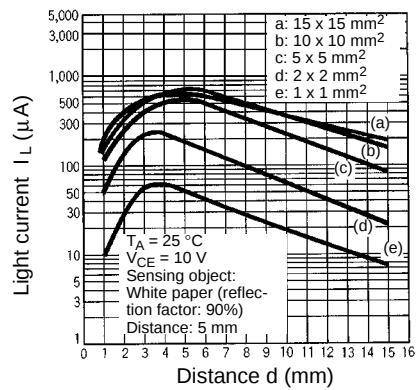
SWITCHING CHARACTERISTICS (RISING TIME)



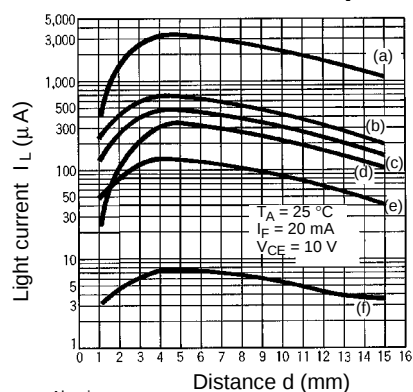
SWITCHING CHARACTERISTICS (FALLING TIME)



SENSING DISTANCE CHARACTERISTICS (TYPICAL 1)



SENSING DISTANCE CHARACTERISTICS (TYPICAL 2)



a: Aluminum

b: White paper with a reflection rate of 90 %

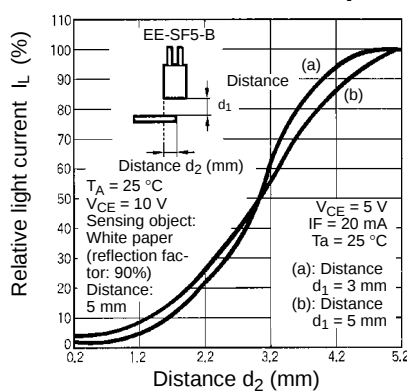
c: Pink paper

d: OHP

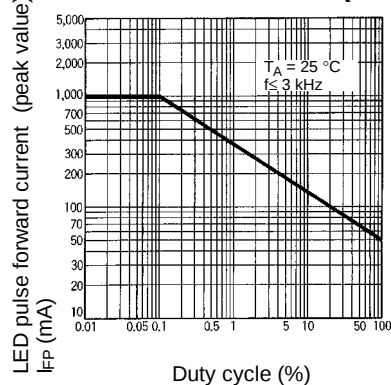
e: Tracing paper

f: Black sponge

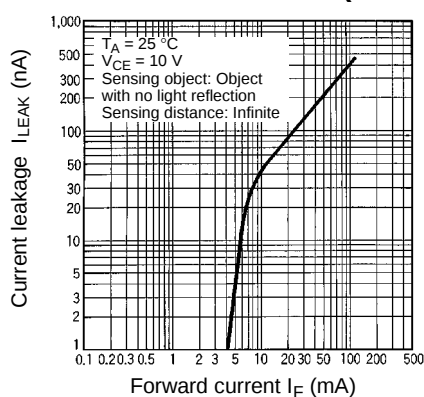
SENSING DISTANCE CHARACTERISTICS (TYPICAL 3)



LED PULSE FORWARD CURRENT CHARACTERISTICS (TYPICAL)



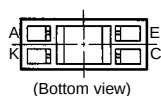
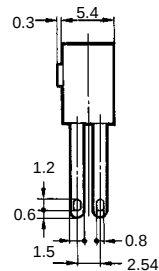
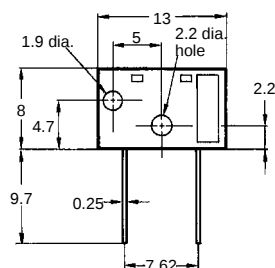
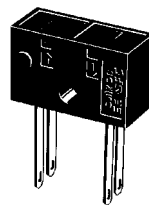
LEAKAGE CURRENT CHARACTERISTICS (TYPICAL)



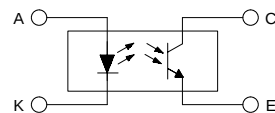
Dimensions

Unit: mm (inch)

■ EE-SF5 (SOLDERING TERMINALS)

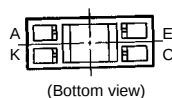
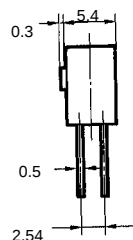
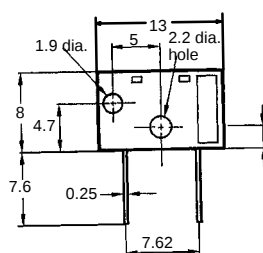
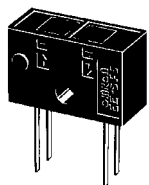


Internal Circuit
(All Models)



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

■ EE-SF5-B (PCB TERMINALS)



Precautions

Refer to the Technical Information Section for general precautions.

NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

OMRON[®]
OMRON ELECTRONICS, INC.
 One East Commerce Drive
 Schaumburg, IL 60173
1-800-55-OMRON

OMRON CANADA, INC.
 885 Milner Avenue
 Scarborough, Ontario M1B 5V8
416-286-6465