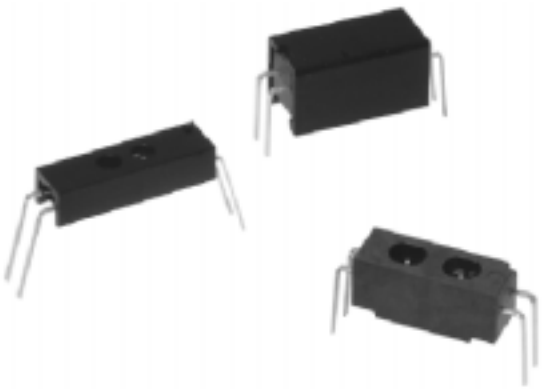
OMRON®

EE-SY171/SY113/SY110

Compact Reflective Phototransistor Output

- Low-profiled model with an overall height of only 3 mm (EE-SY171)
- Model with a circuit integrated into molded housing provides special cost advantages (EE-SY113/EE-SY110)
- Model with a filter reduces effects of external visible light (EE-SY113)



Ordering Information

Appearance	Sensing method	Sensing distance	Sensing object	Output configuration	Weight	**Part Number**
	Reflective	3.5 mm	White paper with reflection factor of 90%	Phototransistor	0.3 g	**EE-SY171**
		4.4 mm			Approx. 0.5 g	**EE-SY113**
		5 mm			Approx. 0.4 g	**EE-SY110**

Specifications

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

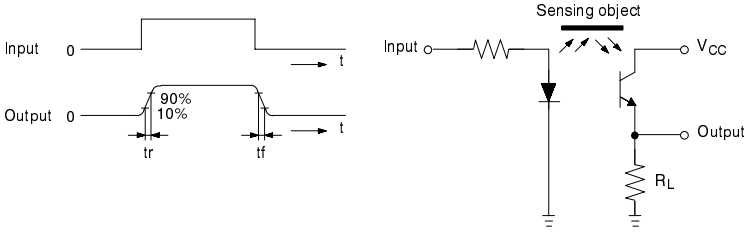
Item		Symbol	Rated value
Input	Forward current	I_F	50 mA*
	Pulse forward current	I_{FP}	1 A**
	Reverse voltage	V_R	4 V
Output	Collector-emitter voltage	V_{CEO}	30 V
	Collector current	I_C	20 mA
	Collector dissipation	P_C	100 mW*
Ambient temperature	Operating	Topr	−40° to 85°C
	Storage	Tstg	−40° to 85°C

*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)

Item		Symbol	EE-SY110		EE-SY171		EE-SY113	
			Value	Condition	Value	Condition	Value	Condition
Emitter	Forward voltage	V_F	1.5 V max.	I_F = 30 mA	1.5 V max.	I_F = 30 mA	1.5 V max.	I_F = 30 mA
	Reverse current	I_R	10 μA max.	V_R = 4 V	10 μA max.	V_R = 4 V	10 μA max.	V_R = 4 V
	Peak emission wavelength	λp(L)	940 nm typ.	I_F = 20 mA	940 nm typ.	I_F = 20 mA	940 nm typ.	I_F = 20 mA
Receiver	Dark current	I_D	200 nA max.	V_{CE} = 10 V 0/x	200 nA max.	V_{CE} = 10 V 0/x	200 nA max.	V_{CE} = 10 V 0/x
	Peak spectral sensitivity wavelength	λp(P)	850 nm typ.	V_{CE} = 10 V	850 nm typ.	V_{CE} = 10 V	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 White paper with a reflection factor of 90% at a distance of 5 mm	50 to 500 μA	I_F = 20 mA V_{CE} = 10 V White paper with a reflection factor of 90% at a distance of 3.5 mm	160 to 1,600 μA	I_F = 20 mA V_{CE} = 10 V White paper with a reflection factor of 90% at a distance of 4.4 mm
	Leakage current	I_{LEAK}	2 μA max.	I_F = 20 mA V_{CE} = 10 V*	200 nA max.	I_F = 20 mA V_{CE} = 10 V*	2 μA max.	I_F = 20 mA V_{CE} = 10 V*
	Rising time**	tr	30 μs typ.	V_{CC} = 5 V R_L = 1 kΩ I_L = 1 mA	30 μs typ.	V_{CC} = 5 V R_L = 1 kΩ I_L = 1 mA	30 μs typ.	V_{CC} = 5 V R_L = 1 kΩ I_L = 1 mA
	Falling time**	tf	30 μs typ.		30 μs typ.		30 μs typ.	

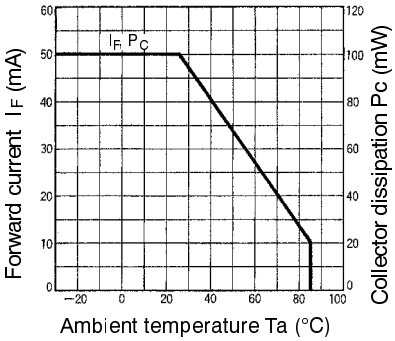
*The sensing object reflects no light.
**The following illustrations show the rising time, tr, and the falling time, tf.



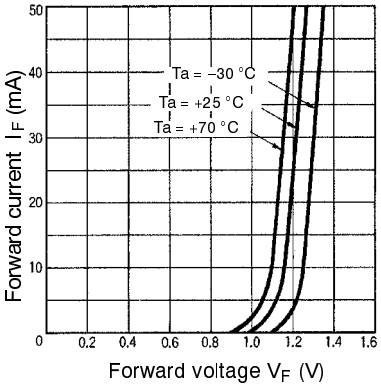
Engineering Data

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

■ TEMPERATURE CHARACTERISTICS

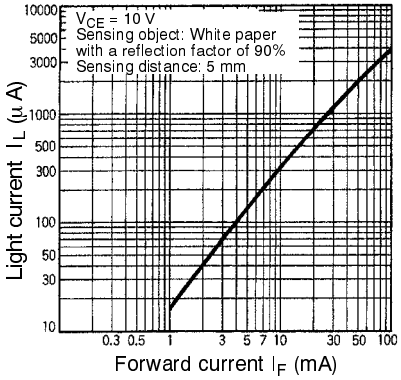


■ INPUT CHARACTERISTICS (TYPICAL)



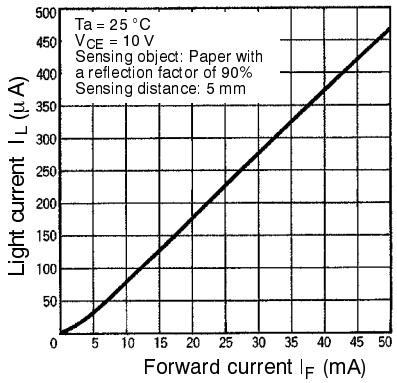
■ INPUT/OUTPUT CHARACTERISTICS (TYPICAL)

EE-SY110



■ OUTPUT CHARACTERISTICS (TYPICAL)

EE-SY171



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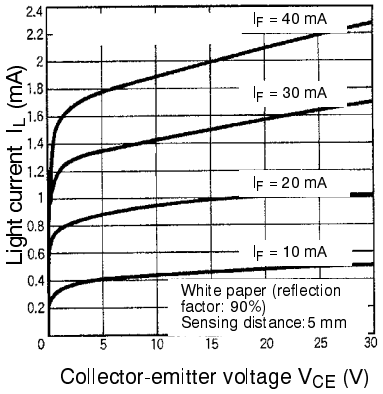
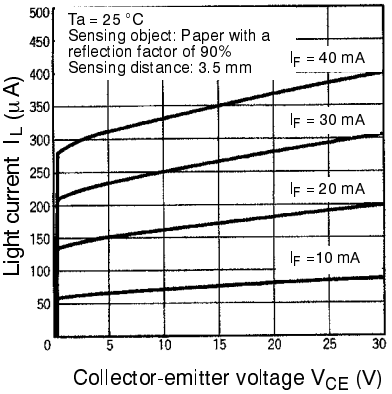
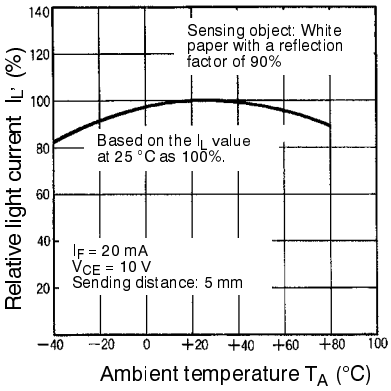


EE-SY171

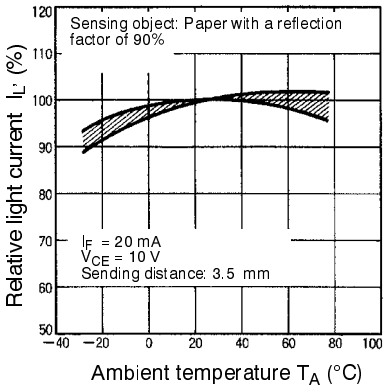


■ LIGHT CURRENT TEMPERATURE DEPENDENCY (TYPICAL)

EE-SY110/113

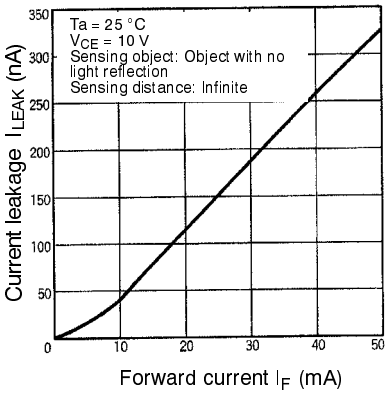


EE-SY171



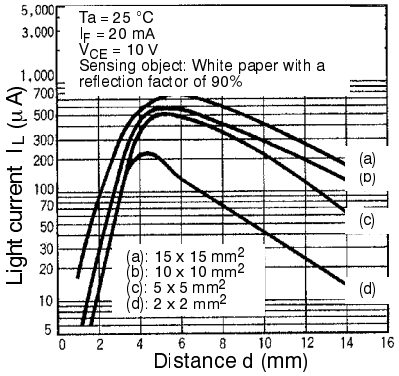
■ LEAKAGE CURRENT CHARACTERISTICS (TYPICAL)

EE-SY171



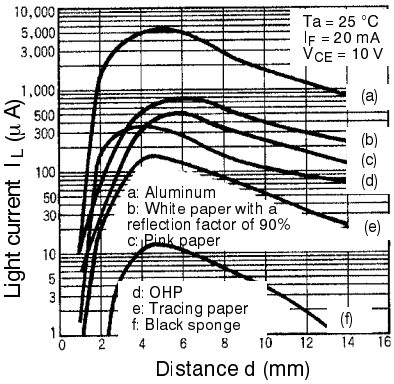
■ SENSING DISTANCE CHARACTERISTICS 1 (TYPICAL)

EE-SY110



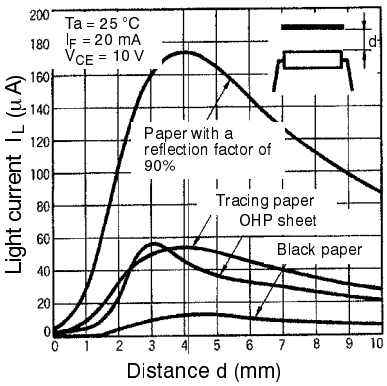
■ SENSING DISTANCE CHARACTERISTICS 2 (TYPICAL)

EE-SY171



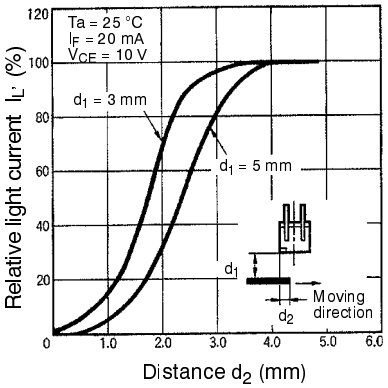
■ SENSING DISTANCE CHARACTERISTICS (TYPICAL)

EE-SY171

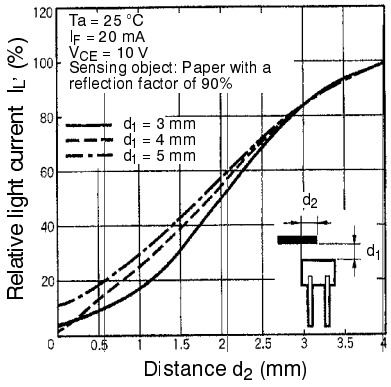


■ SENSING DISTANCE CHARACTERISTICS (TYPICAL), continued

EE-SY110

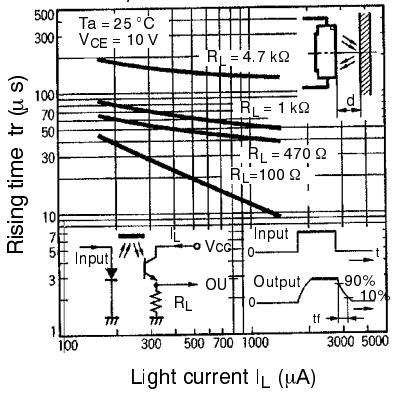


EE-SY171



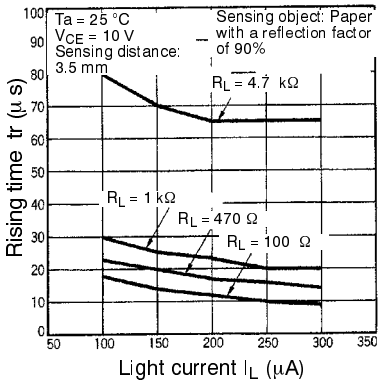
■ SWITCHING CHARACTERISTICS (RISE TIME, TYPICAL)

EE-SY110/113

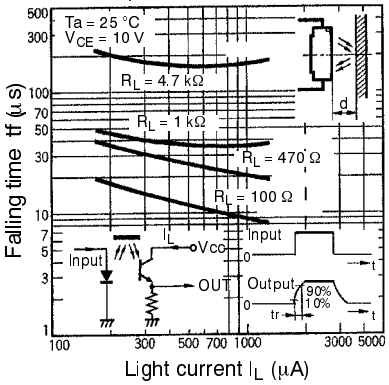


■ SWITCHING CHARACTERISTICS (FALL TIME, TYPICAL)

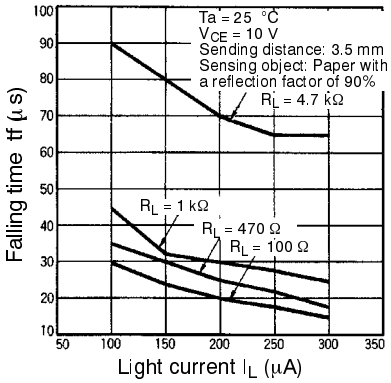
EE-SY171



EE-SY110/113

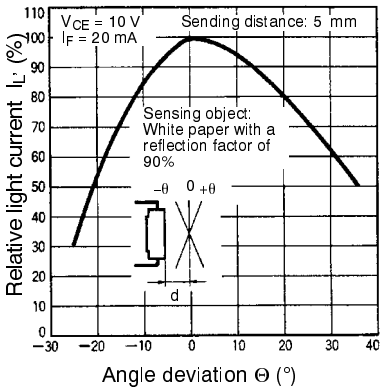


EE-SY171



■ SENSING ANGLE CHARACTERISTICS (TYPICAL)

EE-SY110



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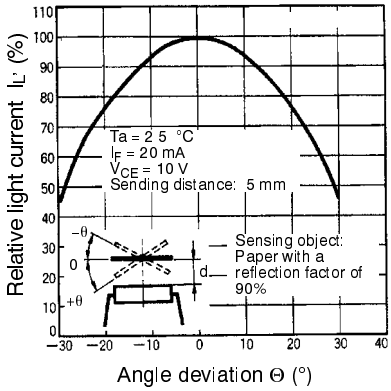
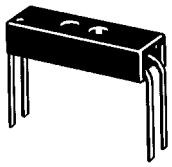
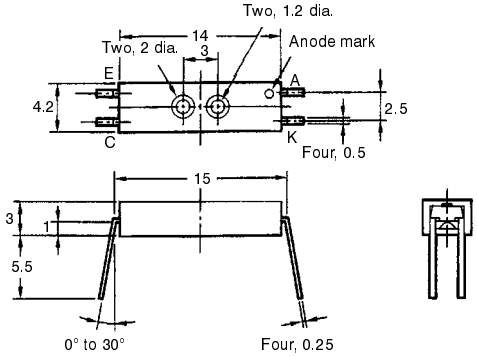


Dimensions

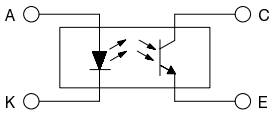
Unit: mm

■ EE-SY171



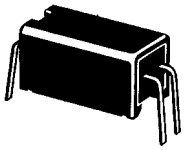


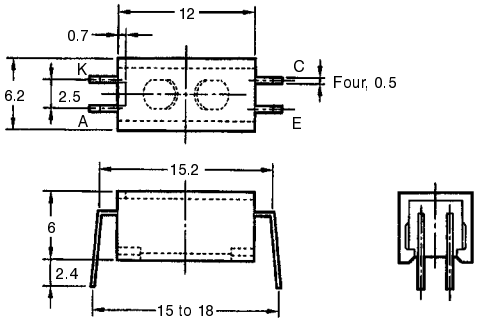
Internal Circuit
(All Models)



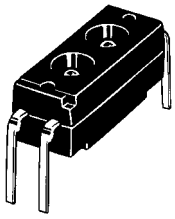
Terminal No.	Name
A	Anode
K	Cathode
C	Collector
E	Emitter

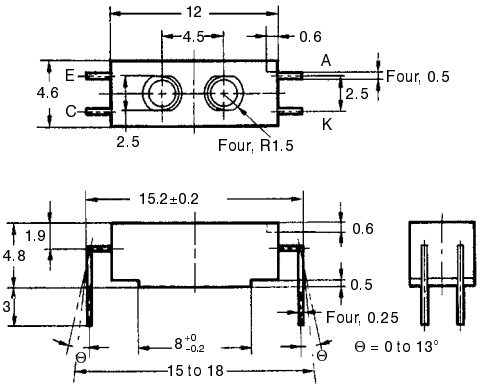
■ EE-SY113





■ EE-SY110





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.

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