

EE-SMR1-1

Top View Reflective Phototransistor Model

- Subminiature, with stem size of 5.8 mm dia. (TO-18)
- Extended life and high reliability assured through use of infrared LED and phototransistor



Ordering Information

Appearance	Sensing method	Sensing distance	Sensing object	Output configuration	Weight	Part number
	Reflective	1 mm	White paper with reflection factor of 90%	Phototransistor	Approx. 0.2 g	EE-SMR1-1

Specifications

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

Item		Symbol	Rated value
Input	Forward current	I_F	40 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	150 mW*
Ambient temperature	Operating	T_{opr}	0°C to 60°C (32° to 140°F)***
	Storage	T_{stg}	-20°C to 80°C (-4° 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.

***Without freezing or condensation.

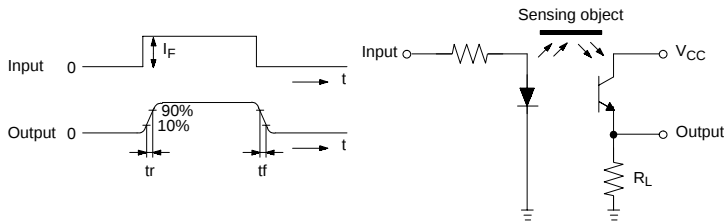
CHARACTERISTICS (T_A = 25°C (77°F))

Item		Symbol	Value	Condition
Input	Forward voltage	V _F	1.5 V max.	I _F = 30 mA
	Reverse current	I _R	10 μA max.	V _R = 4 V
Output	Dark current	I _D	400 nA max.	V _{CE} = 10, V 0/x
Combination	Light current (Collector current)	I _L	80 to 1,000 μA	I _F = 10 mA* V _{CE} = 10 V
	Leakage current	I _{LEAK}	1 μA max.	I _F = 10 mA** V _{CE} = 10 V
	Rising time***	t _r	35 μs typ	V _{CC} = 10 V R _L = 1 kΩ I _L = 100 μA
	Falling time***	t _f	25 μs typ	

*The sensing object is white paper with a reflection factor of 90% at a sensing distance of 1 mm.

**The sensing object reflects no light.

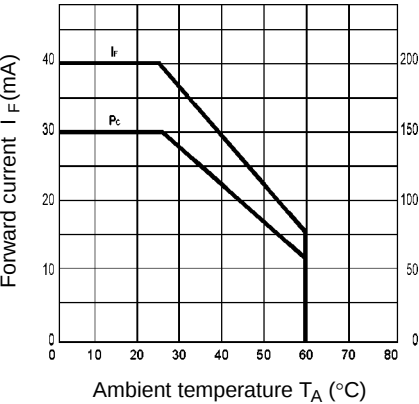
***The following illustrations show the rising time, t_r, and the falling time, t_f.



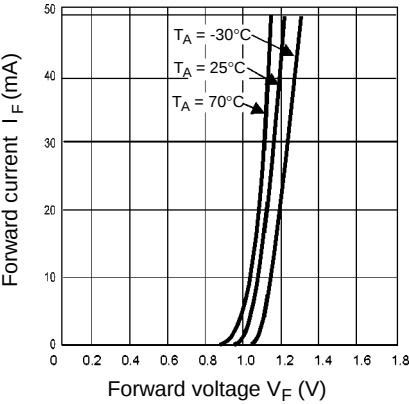
Engineering Data

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

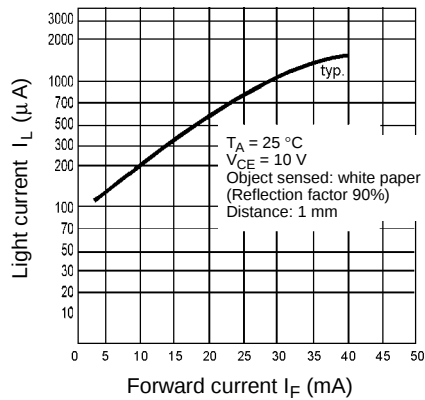
TEMPERATURE CHARACTERISTICS



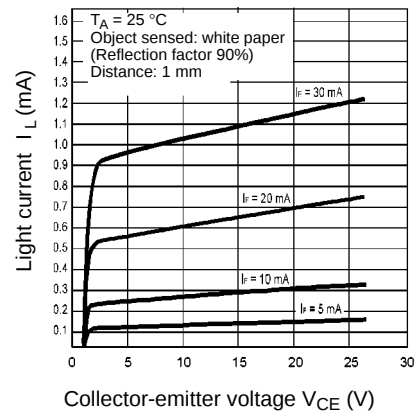
INPUT CHARACTERISTICS (TYPICAL)



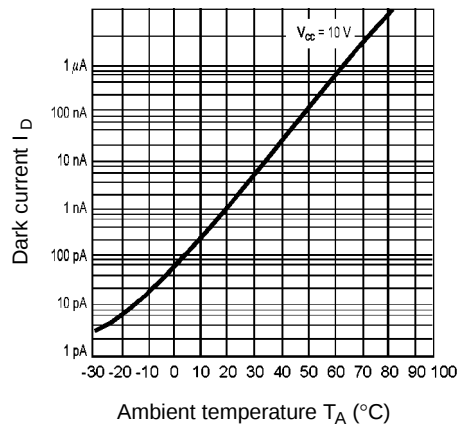
INPUT/OUTPUT CHARACTERISTICS (TYPICAL)



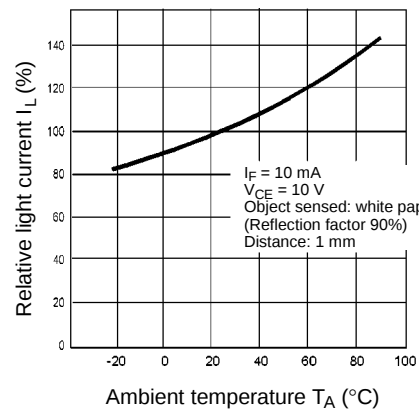
OUTPUT CHARACTERISTICS (TYPICAL)



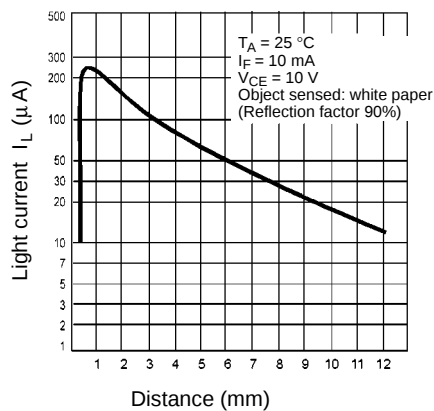
LIGHT CURRENT TEMPERATURE DEPENDENCY (TYPICAL)



LIGHT CURRENT TEMPERATURE DEPENDENCY (TYPICAL)



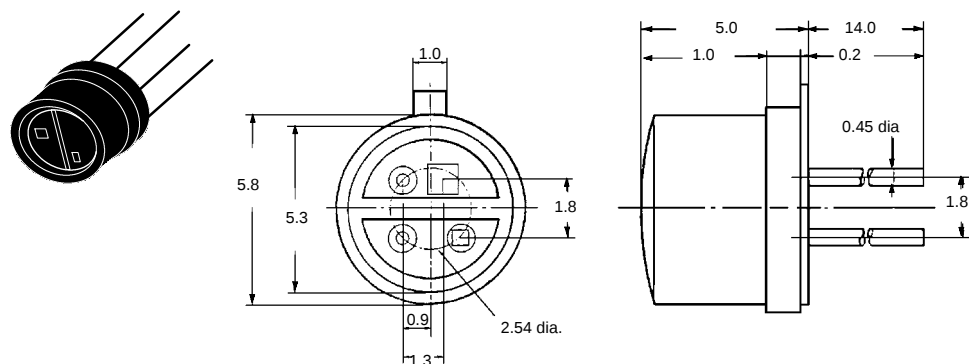
SENSING DISTANCE CHARACTERISTICS



Dimensions

Unit: mm (inch)

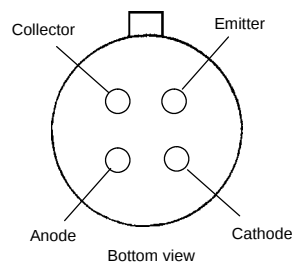
■ EE-SMR1-1



Note: 1. The phototransistor is electrically connected to the collector side in the stem part.

Electrical Connection

■ PINOUT



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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