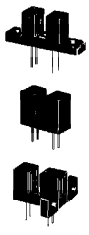
OMRON

EE-SH3/SV3/SJ3

A Series of Phototransistor Output Sensors with Excellent Sensing Position Characteristics and High Resolution

- High-resolution model detecting 0.2-mm-dia. objects and high-sensitivity model detecting 1.0-mm-dia. objects
- Utilizes a center mark for simplified optical axis adjustment
- Incorporates soldering terminals (EE-SH3) or PCB terminals (EE-SH3-B)
- Compact models with no mounting tabs ideal to be built into various types of equipment (EE-SJ3-C/EE-SJ3-D/ EE-SJ3-G)

Ordering Information

Appearance	Sensing method	Slot width	Slot depth	Sensing object	Output configuration	Weight	**Part number**
Soldering terminals 	Transmissive	3.4 mm	7.2 mm	Opaque, 0.5 x 2.1 mm min.	Phototransistor	Approx. 0.8 g	**EE-SH3**
						Approx. 0.7 g	**EE-SV3**
				Opaque, 1.0 x 2.1 mm min.		Approx. 0.8 g	**EE-SH3-CS**
						Approx. 0.7 g	**EE-SV3-CS**
				Opaque, 0.2 x 2.1 mm min.		Approx. 0.8 g	**EE-SH3-DS**
						Approx. 0.7 g	**EE-SV3-DS**
				Opaque, 2.1 x 0.5 mm min.		Approx. 0.8 g	**EE-SH3-GS**
						Approx. 0.7 g	**EE-SV3-GS**
PCB terminals 				Opaque, 0.5 x 2.1 mm min.		Approx. 0.8 g	**EE-SH3-B**
						Approx. 0.7 g	**EE-SV3-B**
				Opaque, 1.0 x 2.1 mm min.		Approx. 0.8 g	**EE-SH3-C**
						Approx. 0.7 g	**EE-SV3-C**
						Approx. 0.6 g	**EE-SJ3-C**
				Opaque, 0.2 x 2.1 mm min.		Approx. 0.8 g	**EE-SH3-D**
						Approx. 0.7 g	**EE-SV3-D**
						Approx. 0.6 g	**EE-SJ3-D**
				Opaque, 2.1 x 0.5 mm min.		Approx. 0.8 g	**EE-SH3-G**
						Approx. 0.7 g	**EE-SV3-G**
						Approx. 0.6 g	**EE-SJ3-G**

Specifications

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25°C (77°F))

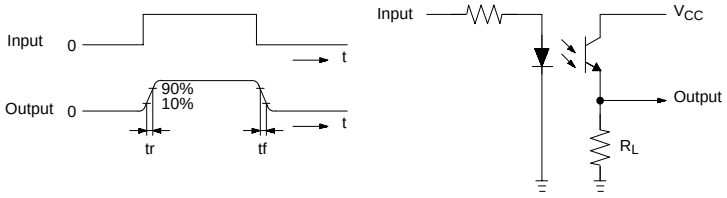
Item		Symbol	Rated value
Input	Forward current	I_F	50 mA*
	Reverse voltage	V_R	4 V
Output	Collector-emitter voltage	V_{CEO}	30 V
	Collector current	I_C	20 mA
	Collector dissipation	P_C	100 mW*
Ambient temperature	Operating	Topr	-25°C to 85°C (-13°F to 185°F)
	Storage	Tstg	-30°C to 100°C (-22°F to 212°F)

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

■ CHARACTERISTICS (T_A = 25°C (77°F))

Item		Symbol	EE-SH3(-B)/SV3(-B)		EE-SH3-C/CS EE-SV3-C/CS EE-SJ3-C		EE-SH3-D/DS EE-SV3-D/DS EE-SJ3-D		EE-SH3-G/GS EE-SV3-G/GS EE-SJ3-G	
			Value	Condition	Value	Condition	Value	Condition	Value	Condition
Input	Forward voltage	V_F	1.2 V typ. 1.5 V max.	I_F = 30 mA	1.2 V typ. 1.5 V max.	I_F = 30 mA	1.2 V typ. 1.5 V max.	I_F = 30 mA	1.2 V typ. 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	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	940 nm typ.	I_F = 20 mA
Output	Dark current	I_D	2 nA typ. 200 nA max.	V_{CE} = 10 V 0/x	2 nA typ. 200 nA max.	V_{CE} = 10 V 0/x	2 nA typ. 200 nA max.	V_{CE} = 10 V 0/x	2 nA typ. 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	850 nm typ.	V_{CE} = 10 V
Combination	Light current (collector current)	I_L	0.5 to 14 mA min.	I_F = 20 mA V_{CE} = 10 V	1 to 28 mA min.	I_F = 20 mA V_{CE} = 10 V	0.1 mA min.	I_F = 20 mA V_{CE} = 10 V	0.5 to 14 mA min.	I_F = 20 mA V_{CE} = 10 V
	Collector emitter saturated voltage	V_{CE} (sat)	0.4 V max.	I_F = 20 mA I_L = 0.1 mA	0.4 V max.	I_F = 20 mA I_L = 0.1 mA	---		0.4 V max.	I_F = 20 mA I_L = 0.1 mA
	Rising time*	tr	4 μs typ.	V_{CC} = 5 V R_L = 0.1 kΩ I_L = 5 mA	4 μs typ.	V_{CC} = 5 V R_L = 0.1 kΩ I_L = 5 mA	4 μs typ.	V_{CC} = 5 V R_L = 0.1 kΩ I_L = 5 mA	4 μs typ.	V_{CC} = 5 V R_L = 0.1 kΩ I_L = 5 mA
	Falling time*	tf	4 μs typ.		4 μs typ.		4 μs typ.		4 μs typ.	

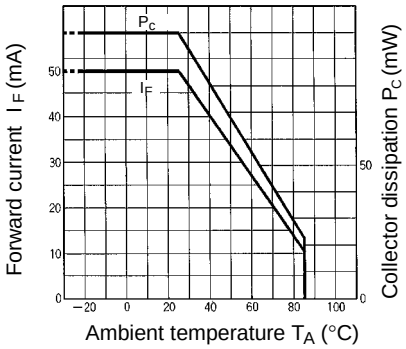
*The following illustrations show the rising time, tr, and the falling time, tf.



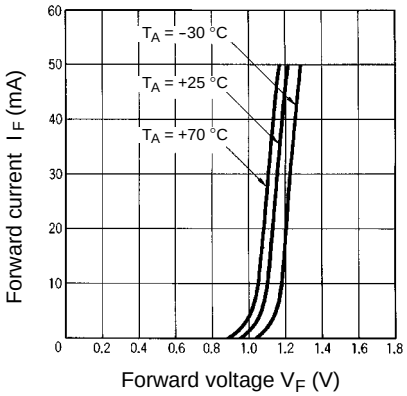
Engineering Data

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

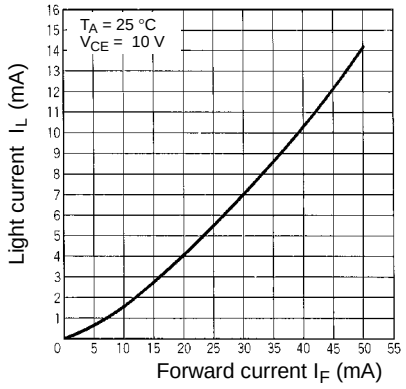
TEMPERATURE CHARACTERISTICS



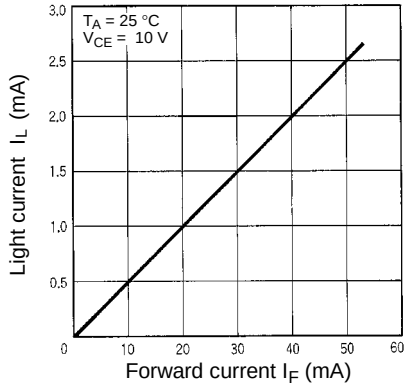
INPUT CHARACTERISTICS (TYPICAL)



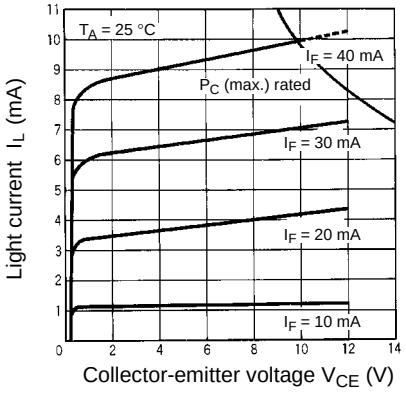
INPUT/OUTPUT CHARACTERISTICS (TYPICAL) APERTURE TYPE 1 (0.5 X 2.1 MM)



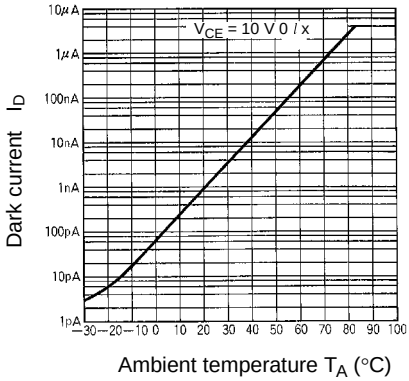
INPUT/OUTPUT CHARACTERISTICS (TYPICAL) APERTURE TYPE 2 (0.2 X 2.1 MM)



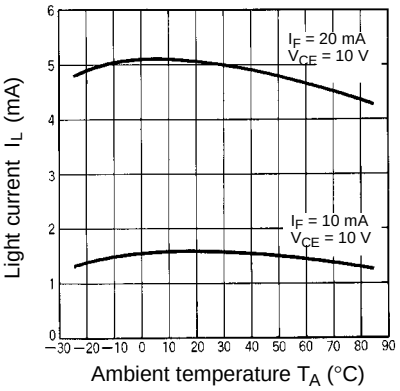
OUTPUT CHARACTERISTICS (TYPICAL) APERTURE (0.5 X 2.1 MM)



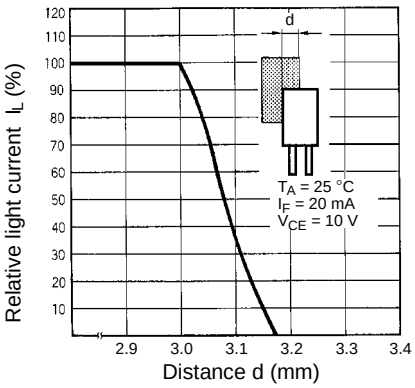
DARK CURRENT TEMPERATURE DEPENDENCY (TYPICAL)



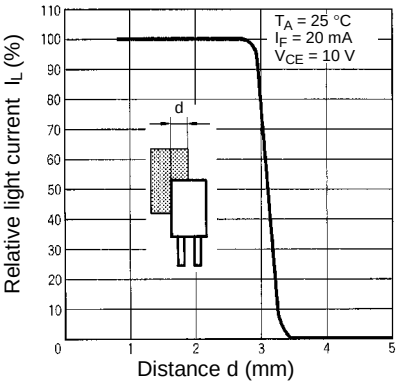
■ LIGHT CURRENT TEMPERATURE DEPENDENCY (TYPICAL) APERTURE (0.5 X 2.1 MM)



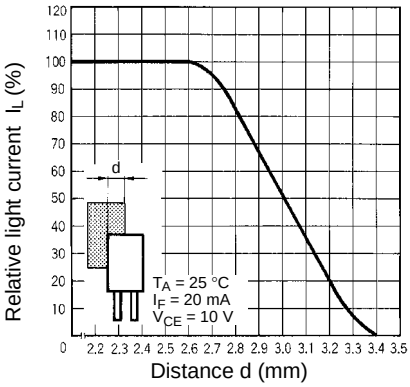
■ SENSING POSITION CHARACTERISTICS 1 (TYPICAL) APERTURE (0.5 X 2.1 MM)



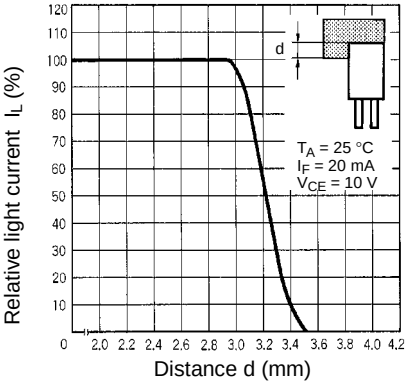
■ SENSING POSITION CHARACTERISTICS 2 (TYPICAL) APERTURE (0.5 X 2.1 MM)



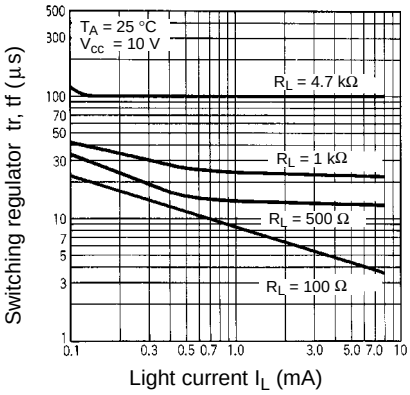
■ SENSING POSITION CHARACTERISTICS 3 (TYPICAL) APERTURE (1.0 X 2.1 MM)



■ SENSING POSITION CHARACTERISTICS 4 (TYPICAL) APERTURE (2.1 X 0.5 MM)



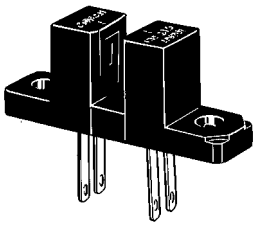
■ SWITCHING CHARACTERISTICS (TYPICAL)



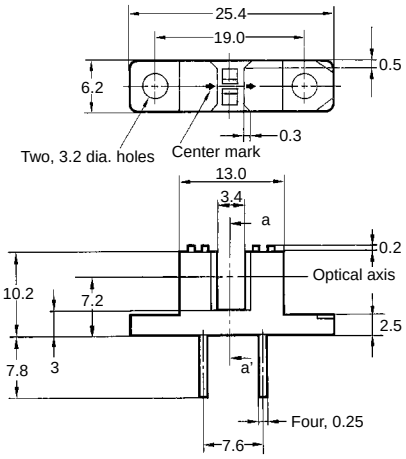
Dimensions

Unit: mm (inch)

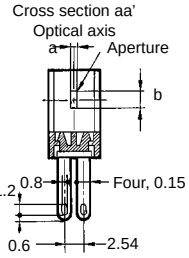
EE-SH3 (-CS, -DS, GS)/SH3-B (-C, -D, -G)



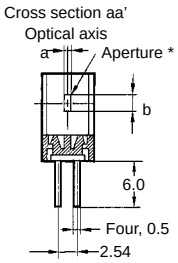
* With soldering terminal



With soldering Terminal

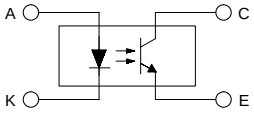


With PCB Terminal



*The width of the aperture on the emitter and that on the receiver are the same in size.

Internal Circuit
(All Models)

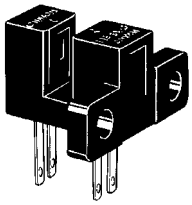


Terminal No.	Name
A	Anode
K	Cathode
C	Collector
E	Emitter

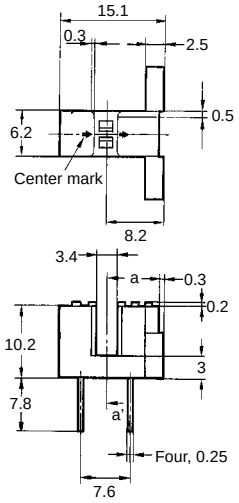
Model	Aperture (a x b)
EE-SH3	0.5 x 2.1
EE-SH3-CS	1.0 x 2.1
EE-SH3-DS	0.2 x 2.1
EE-SH3-GS	2.1 x 0.5

Model	Aperture (a x b)
EE-SH3-B	0.5 x 2.1
EE-SH3-C	1.0 x 2.1
EE-SH3-D	0.2 x 2.1
EE-SH3-G	2.1 x 0.5

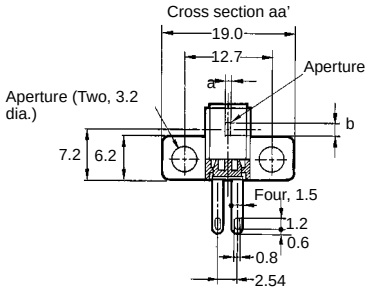
EE-SV3 (-CS, -DS, GS)/SV3-B (-C, -D, -G)



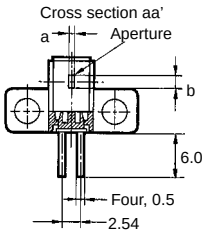
* With soldering terminal



With soldering Terminal

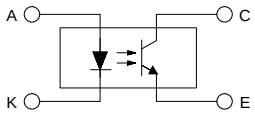


With PCB Terminal



*The width of the aperture on the emitter and that on the receiver are the same in size.

Internal Circuit
(All Models)

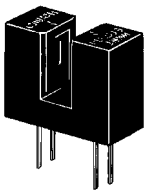


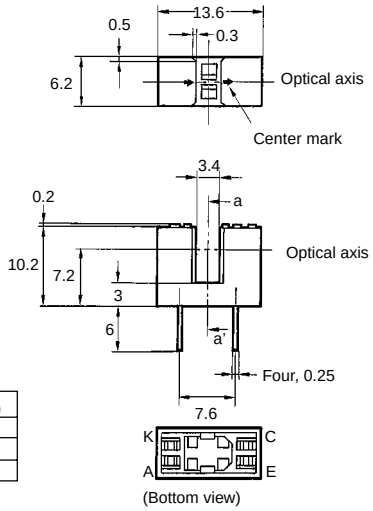
Terminal No.	Name
A	Anode
K	Cathode
C	Collector
E	Emitter

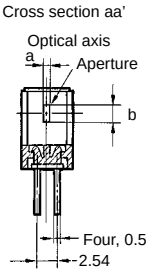
Model	Aperture (a x b)
EE-SV3	0.5 x 2.1
EE-SV3-CS	1.0 x 2.1
EE-SV3-DS	0.2 x 2.1
EE-SV3-GS	2.1 x 0.5

Model	Aperture (a x b)
EE-SV3-B	0.5 x 2.1
EE-SV3-C	1.0 x 2.1
EE-SV3-D	0.2 x 2.1
EE-SV3-G	2.1 x 0.5

■ EE-SJ3 (-C, -D, -G)







Model	Aperture (a x b)
EE-SJ3-C	1.0 x 2.1
EE-SJ3-D	0.2 x 2.1
EE-SJ3-G	2.1 x 0.5

* The width of the slit on the emitter and that on the receiver are the same in size.

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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