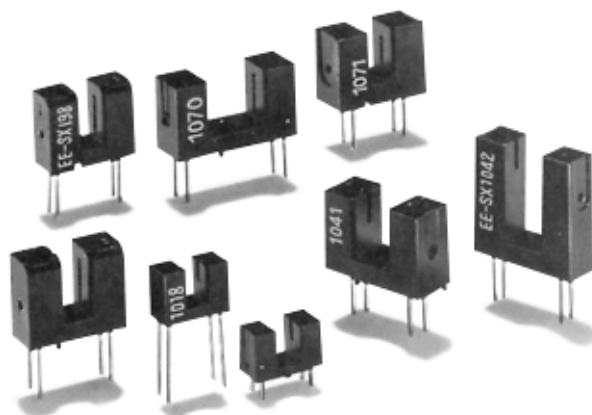


EE-SX198/199/1018/1025/1041/1042/1070/1071

Miniature Transmissive
Photomicrosensor with 2- to 8-mm
Slot Width and Phototransistor
Output

- Stable sensing at temperatures as high as 95°C (EE-SX1041, EE-SX1070)
- Compact model with a 5-mm wide slot (EE-SX1041)
- Model with 12-mm deep and 5-mm wide slot (EE-SX1042)
- Miniature model with a 2-mm wide slot (EE-SX1018)
- Low-profile model (5.4 mm high) with a 2.8-mm slot width (EE-SX1025)



Ordering Information

Appearance	Sensing method	Slot width	Slot depth	Sensing object	Output configuration	Weight	Part number
	Transmissive	2 mm	4.5 mm	Opaque, 0.5 x 1.5 mm min.	Phototransistor	Approx. 0.2 g	EE-SX1018
		2.8 mm	4.4 mm				EE-SX1025
		3 mm	7.5 mm	Opaque, 0.5 x 2 mm min.		Approx. 0.6 g	EE-SX198
							EE-SX199
		3.4 mm	7.2 mm	Opaque, 0.5 x 2.1 mm min.		EE-SX1071	
		5 mm	8.2 mm	Opaque, 0.5 x 2.2 mm min.		EE-SX1041	
		5 mm	12 mm	Opaque, 0.5 x 2 mm min.			Approx. 0.8 g
		8 mm	8.2 mm	Opaque, 0.5 x 2.2 mm min.		Approx. 0.6 g	EE-SX1070

Specifications

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

Item		Symbol	Rated value
Emitter	Forward current	I_F	50 mA*
	Reverse voltage	V_R	4 V
Detector	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 85°C (-13°F to 185°F)**
	Storage	T_{stg}	-30°C to 100°C (-22°F to 212°F)

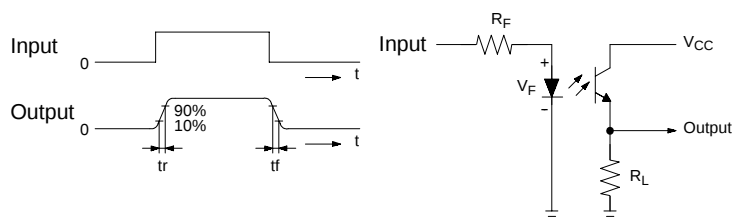
*Refer to Engineering Data if the ambient temperature is not within the normal room temperature range.

**The operating temperature of the EE-SX1041/1070 is -25° to 95°C (-13°F to 203°F).

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

Item		Symbol	EE-SX1018/1025/1041/1042/1070/1071		EE-SX198/199	
			Value	Condition	Value	Condition
Emitter	Forward voltage	V_F	1.2 V typ. 1.5 V max.	$I_F = 30\text{ mA}$	1.2 V typ. 1.4 V max.	$I_F = 20\text{ mA}$
	Reverse current	I_R	0.01 μA typ. 10 μA max.	$V_R = 4\text{ V}$	0.01 μA typ. 10 μA max.	$V_R = 4\text{ V}$
	Peak emission wavelength	$\lambda_p(L)$	940 nm typ.	$I_F = 20\text{ mA}$	940 nm typ.	$I_F = 20\text{ mA}$
Detector	Dark current	I_D	2 nA typ. 200 nA max.	$V_{CE} = 10\text{ V } 0/x$	2 nA typ. 200 nA max.	$V_{CE} = 10\text{ V } 0/x$
	Peak spectral sensitivity wavelength	$\lambda_p(P)$	850 nm typ.	$V_{CE} = 10\text{ V}$	850 nm typ.	$V_{CE} = 10\text{ V}$
Combination	Light current (collector current)	I_L	0.5 mA min. 14 mA max.	$I_F = 20\text{ mA}$ $V_{CE} = 10\text{ V}$	0.5 mA min. 14 mA max.	$I_F = 20\text{ mA}$ $V_{CE} = 5\text{ V}$
	Collector-emitter saturated voltage	$V_{CE}(\text{sat})$	0.1 V typ. 0.4 V max.	$I_F = 20\text{ mA}$ $I_L = 0.1\text{ mA}$	0.1 V typ. 0.4 V max.	$I_F = 40\text{ mA}$ $I_L = 0.5\text{ mA}$
	Rising time (See Note.)	t_r	4 μs typ.	$V_{CC} = 5\text{ V}$ $R_L = 100\ \Omega$ $I_L = 5\text{ mA}$	4 μs typ.	$V_{CC} = 5\text{ V}$ $R_L = 100\ \Omega$ $I_L = 5\text{ mA}$
	Falling time (See Note.)	t_f	4 μs typ.		4 μs typ.	

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

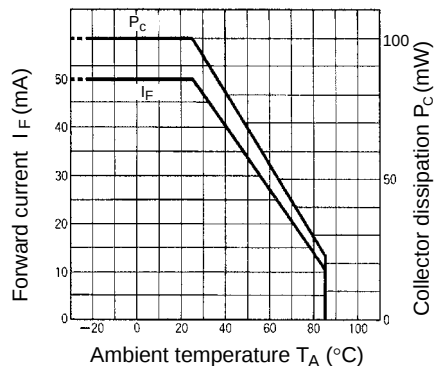


Engineering Data

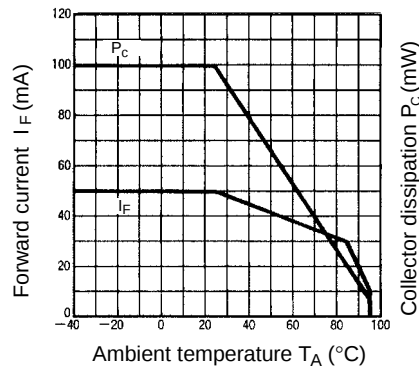
Note: The operating conditions of the photomicrosensor must be within the absolute maximum rating ranges.

■ TEMPERATURE CHARACTERISTICS

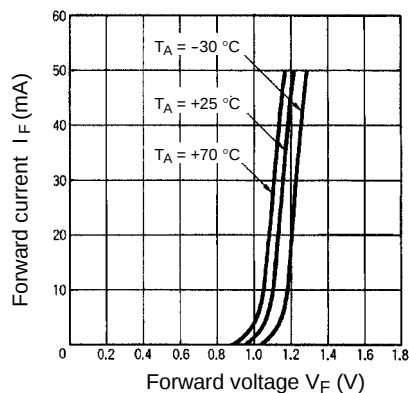
EE-SX198/199/1018/1025/1042/1071



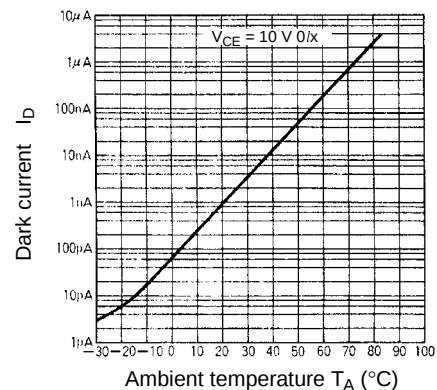
EE-SX1070/1041



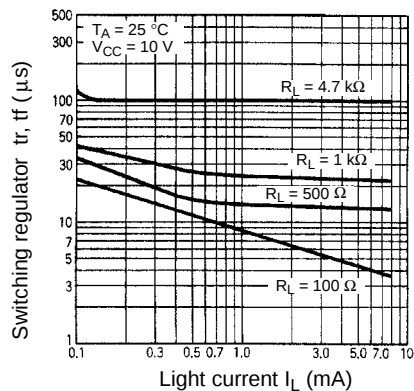
■ INPUT CHARACTERISTICS (TYPICAL)



■ DARK CURRENT TEMPERATURE DEPENDENCY (TYPICAL)

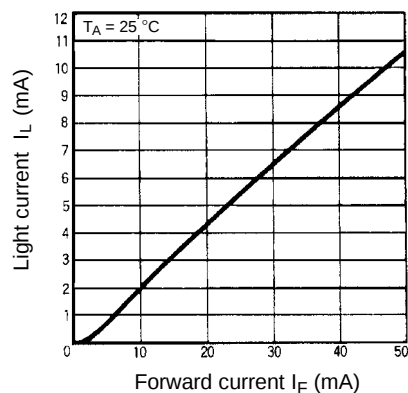


■ SWITCHING CHARACTERISTICS (TYPICAL)

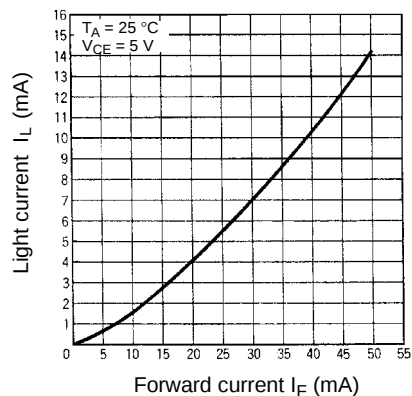


■ I/O CHARACTERISTIC (TYPICAL)

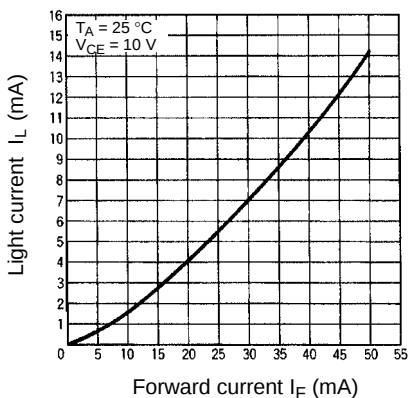
EE-SX1018/1025



EE-SX198/199

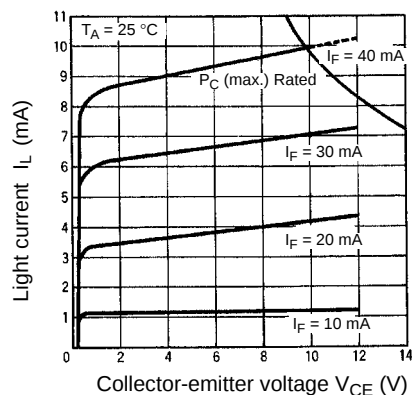


EE-SX1041/1042/1070/1071

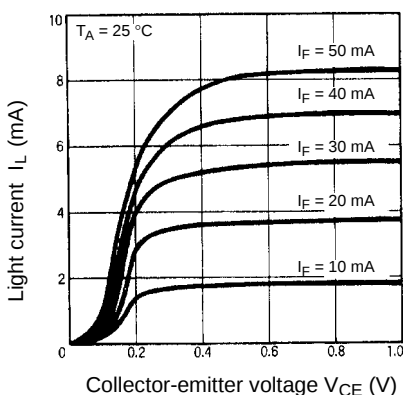


■ OUTPUT CHARACTERISTICS (TYPICAL)

EE-SX198/199/1041/1042/1070/1071

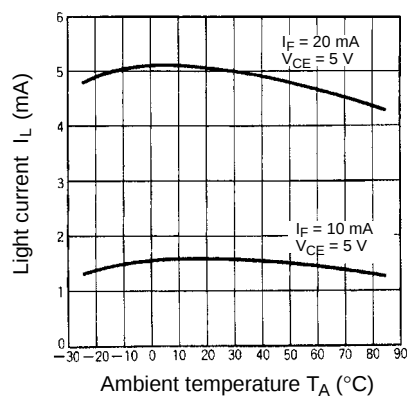


EE-SX1018/1025

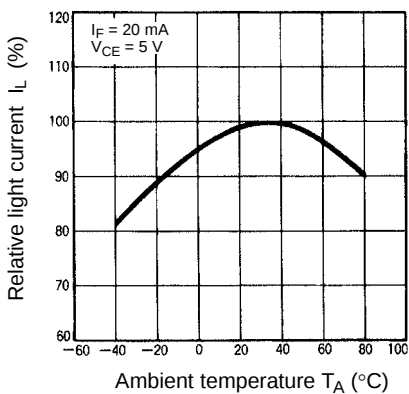


■ LIGHT CURRENT TEMPERATURE DEPENDENCY (TYPICAL)

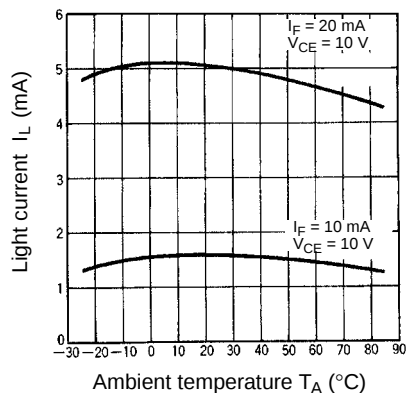
EE-SX198/199



EE-SX1018/1025

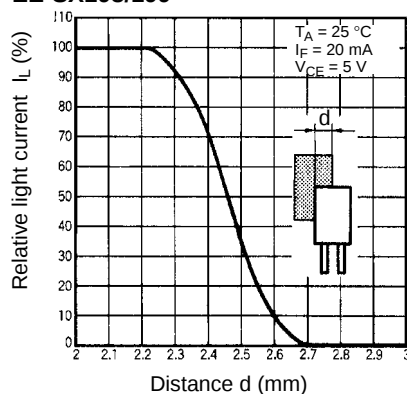


EE-SX1041/1042/1070/1071

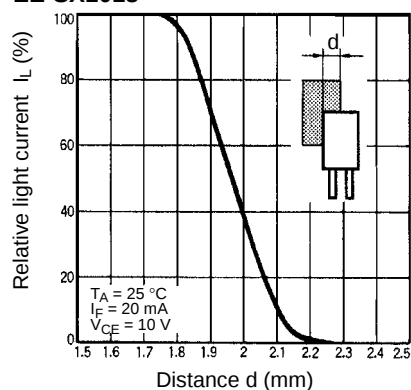


SENSING POSITION CHARACTERISTICS (TYPICAL)

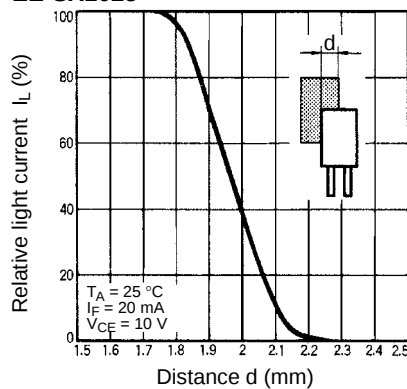
EE-SX198/199



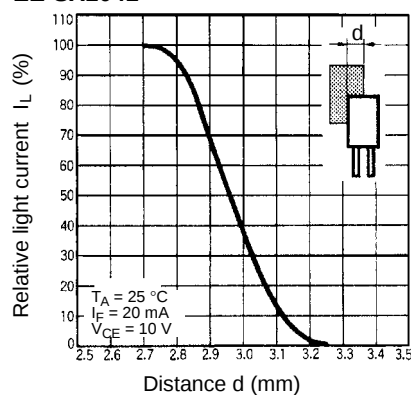
EE-SX1018



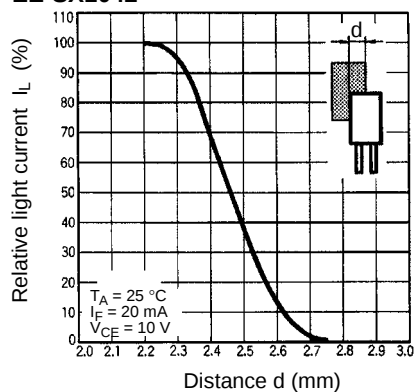
EE-SX1025



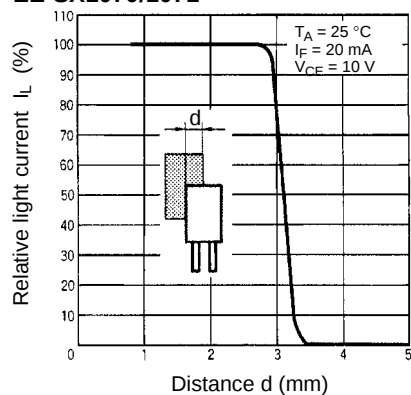
EE-SX1041



EE-SX1042



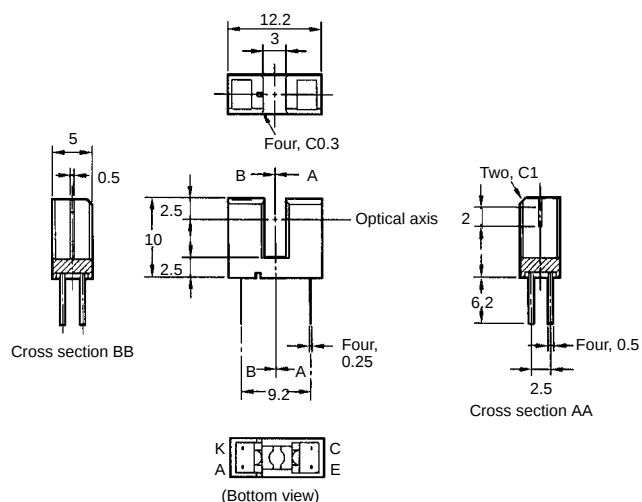
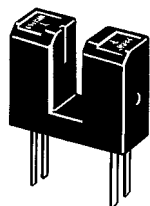
EE-SX1070/1071



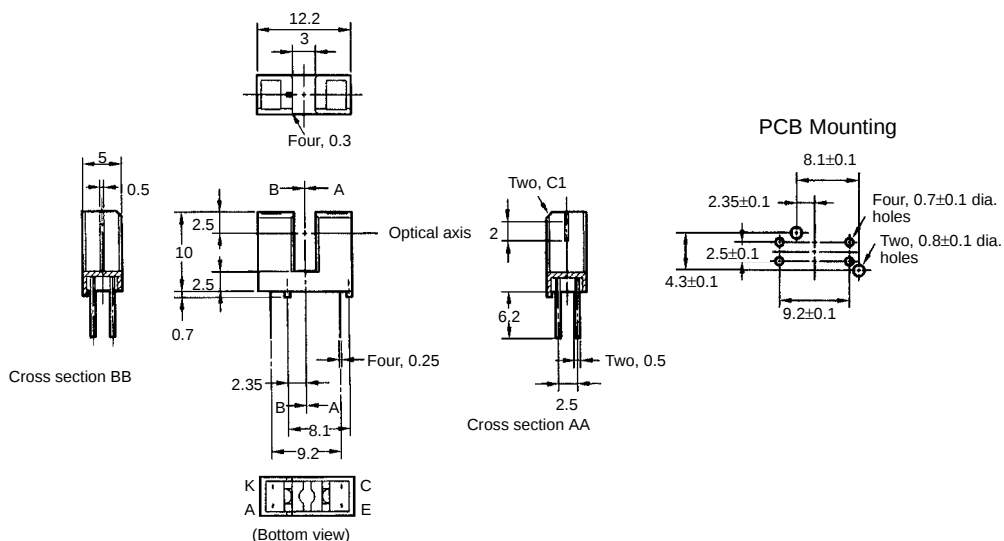
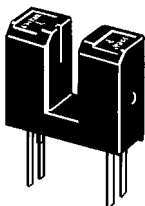
Dimensions

Unit: mm (inch)

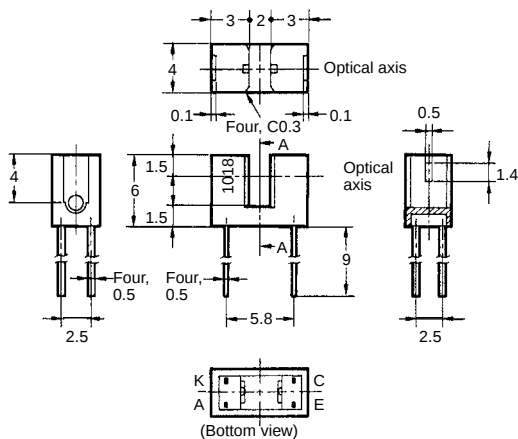
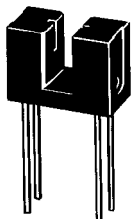
EE-SX198



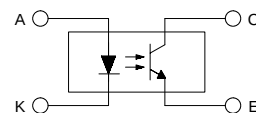
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EE-SX1018

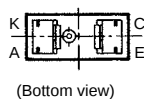
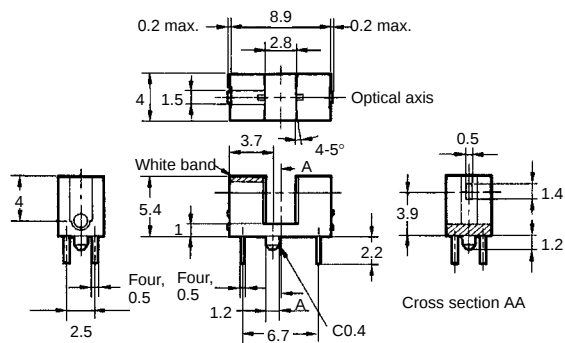
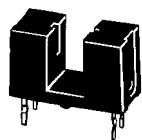


Internal Circuit (All Models)

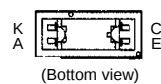
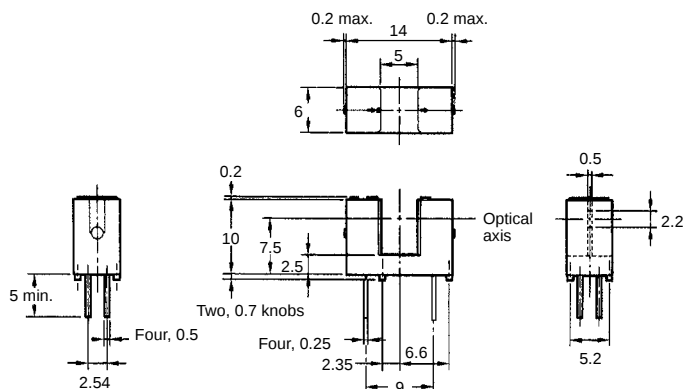
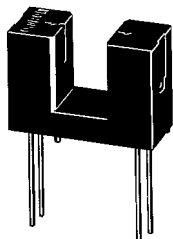


Terminal No.	Name
A	Anode
K	Cathode
C	Collector
E	Emitter

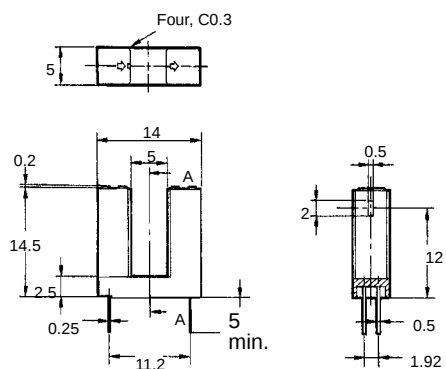
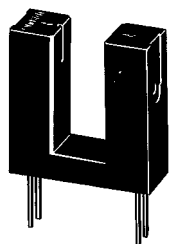
■ EE-SX1025



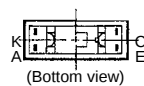
■ EE-SX1041



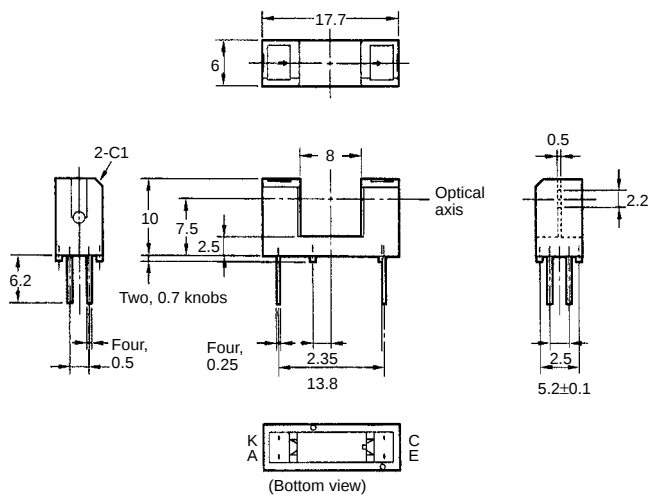
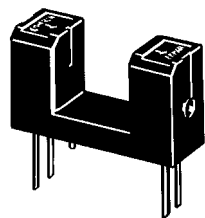
■ EE-SX1042



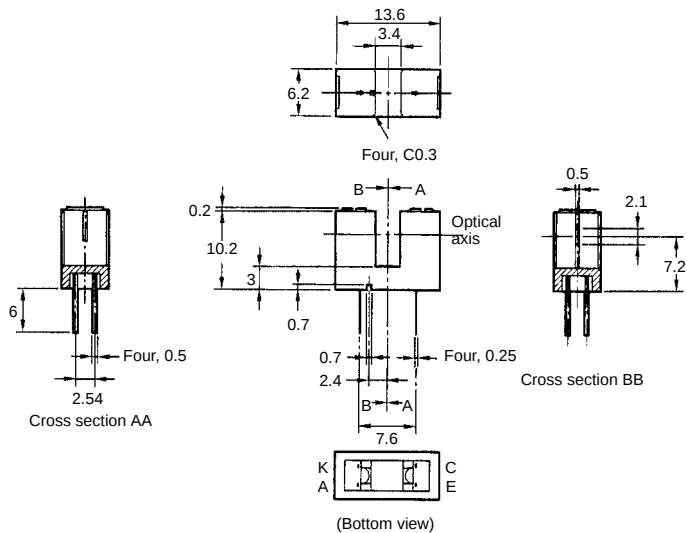
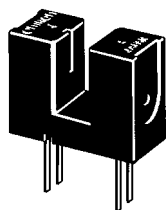
Cross section AA



■ EE-SX1070



■ EE-SX1071



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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