

Printed Circuit Board Sensor

# E3S-LS3

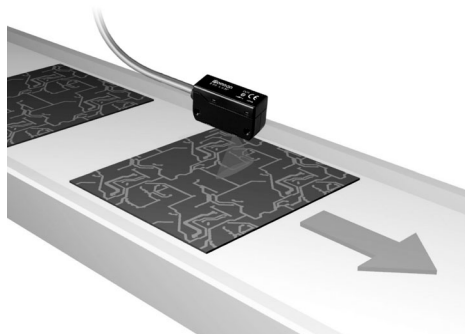
*Printed circuit board sensor capable of stable detection without being affected by holes or notches.*

- Suitable for incorporation in devices (E3S-LS3□).
- Wide range is suitable for component boards with high or irregularly shaped components (E3S-LS3□W).

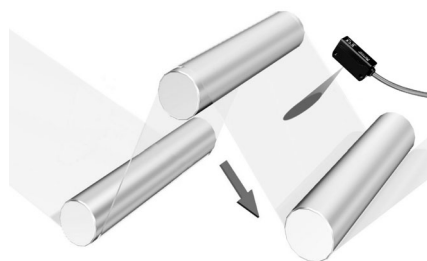


## Applications

Detecting for PCBs



Transparent Film Sheet Detection

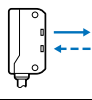
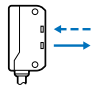


Detection for Wafer-cassette Mounting



Ordering Information

Red light

Sensor type	Shape	Connection method	Detection distance *	Timer function	Model	Output	
Limited reflective		Pre-wired (2 m)	20 to 35 mm	Without	E3S-LS3N	NPN Light ON	
			10 to 60 mm		E3S-LS3NW		
		Pre-wired (2 m) Pre-wired M8 3-pin connector (0.3 m) Pre-wired M8 4-pin connector (0.3 m) Pre-wired (2 m) Pre-wired M8 3-pin connector (0.3 m) Pre-wired M8 4-pin connector (0.3 m)	20 to 35 mm	Without	E3S-LS3P	PNP Light ON	
					With		E3S-LS3PT
					Without		E3S-LS3P-M5J
					With		E3S-LS3PT-M5J
					Without		E3S-LS3P-M3J
					With		E3S-LS3PT-M3J
					Without		E3S-LS3PW
					With		E3S-LS3PWT
	10 to 60 mm	Without	E3S-LS3PW-M5J				
			With	E3S-LS3PWT-M5J			
			Without	E3S-LS3PW-M3J			
			With	E3S-LS3PWT-M3J			

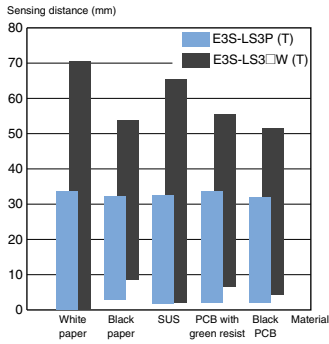
\* Using 80 x 80 mm white art paper

Rating/performance

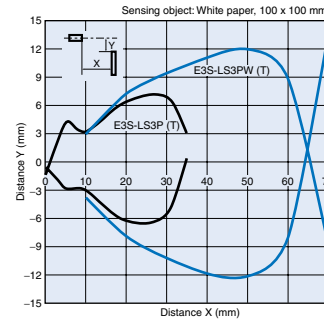
Sensor type		Limited reflective			
Item	Model	E3S-LS3□	E3S-LS3PT	E3S-LS3□W	E3S-LS3PWT
Sensing	White art paper	20 to 35 mm		10 to 60 mm	
	Black paper *	20 to 30 mm		15 to 50 mm	
Light source (wave length)	Red LED (660 nm)				
Power supply voltage	12 to 24 VDC±10%, ripple (p-p) 10% max.				
Current consumption	25 mA max.				
Control output	Load power supply voltage: 24 VDC max.; Load current: 100 mA max., Residual voltage: 2 V max.; Operating mode: Light ON				
Response time	1 ms max. for operation and reset respectively				
Timer function	Available with E3S-LS3P(W)T models only. Time range: 0.1 to 1.0 s (adjustable)				
Ambient illuminance	Receiver side: Incandescent lamp: 5,000 lux max.				
Ambient temperature	Operating: -10 to 55° C (with no icing or condensation)				
Ambient humidity	Operating: 35% to 85% (with no condensation)				
Insulation resistance	20 MΩ min. (at 500 VDC) between charged parts and the case				
Dielectric strength	1,000 VAC at 50/60 Hz for 1 minute between charged parts and the case				
Vibration resistance	10 to 55 Hz with a 1.5-mm double amplitude for 2 hrs each in X, Y and Z directions				
Shock resistance	500 m/s <sup>2</sup> , 3 times each in X, Y and Z directions				
Protective structure	IEC60529 IP40				
Connection method	Pre-wired (standard length: 2 m)/Pre-wired M8 connector (standard length: 0.3 m)				
Indicators	Operation indicator (orange)				
Weight (Packed state)	Pre-wired models: Approx. 80 g; Pre-wired M8 connector: Approx. 45 g				
Material	Case	ABS			
	Lens	Acrylic			
Accessories	Instruction sheet, M3 screws,				

### Characteristic data (typical)

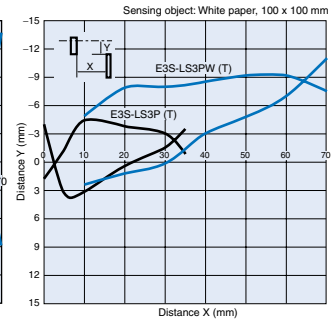
#### Sensing Distance vs. Materials



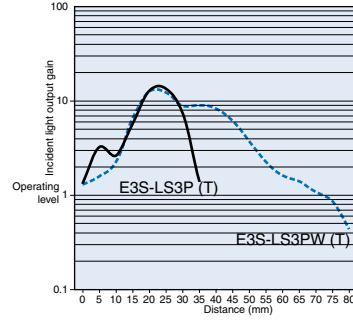
#### Operating Range (Left and Right)



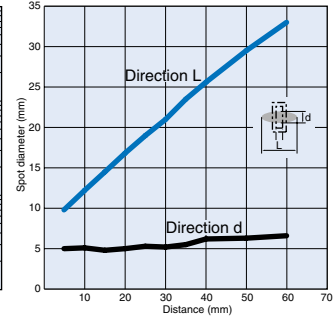
#### Operating Range (Up and Down)



#### Output vs. Set Distance



#### Spot Diameter vs. Sensing Distance



E3S-LS3

### Output Circuit Diagram

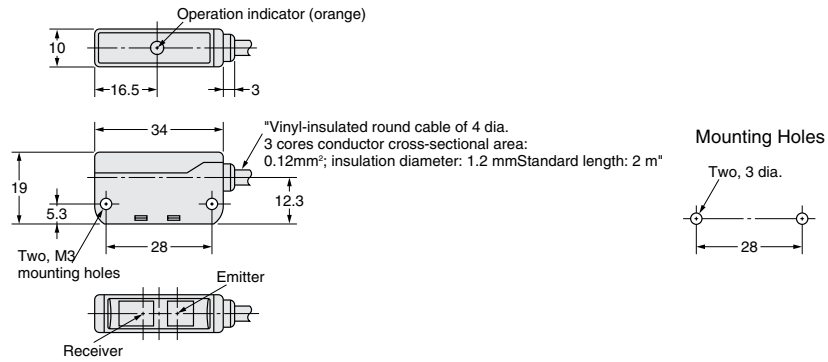
NPN output (PNP output will be available soon)

Model	Operating status of output transistor	Timing chart	Output circuit
E3S-LSN3 E3S-LS3NW	Light ON	Incident light: ON (high pulse) Interrupted: OFF (low pulse) Operation indicator (orange): ON (high pulse) OFF (low pulse) Output transistor: ON (high pulse) OFF (low pulse)	
E3S-LS3P E3S-LS3PW		Incident light: ON (high pulse) No Incident light: OFF (low pulse) Operation indicator (orange): ON (high pulse) OFF (low pulse) Output transistor: ON (high pulse) OFF (low pulse)	
E3S-LS3PT E3S-LS3PWT		Incident light: ON (high pulse) No Incident light: OFF (low pulse) Operation indicator (orange): ON (high pulse) OFF (low pulse) Output transistor: ON (high pulse) OFF (low pulse) T: Off-delay timer (0.1 to 1.0 s)	

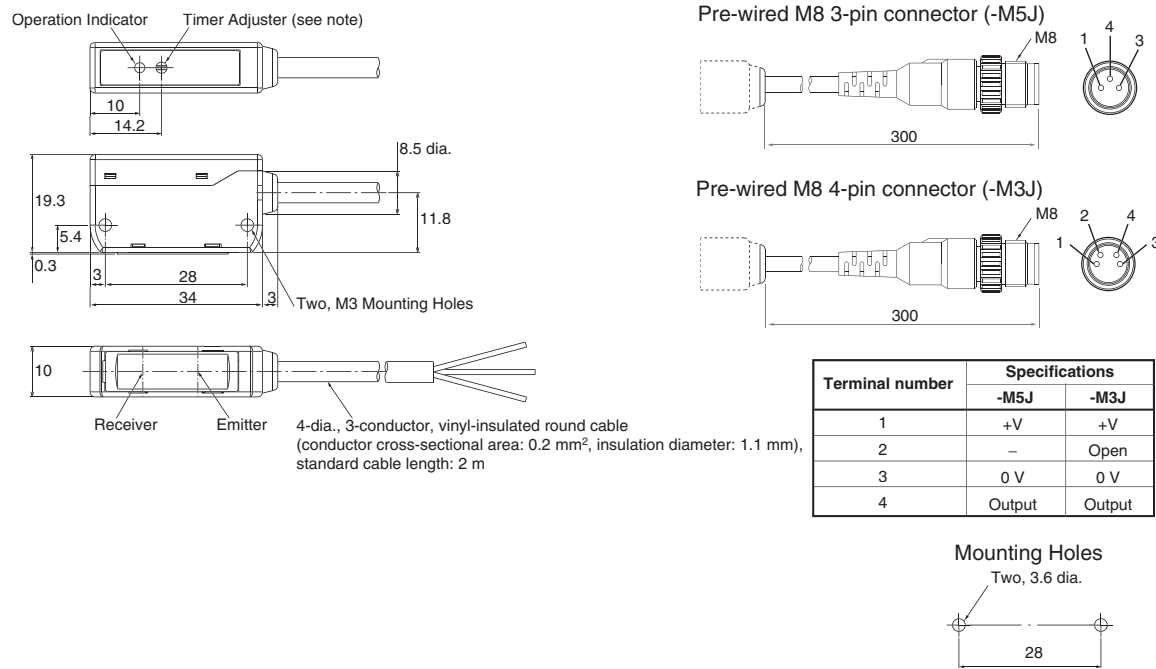
Dimensions (Unit: mm)

Note: All units are in millimeters unless otherwise indicated.

E3S-LS3N  
E3S-LS3NW



E3S-LS3□(T)(-M5J/-M3J)  
E3S-LS3□W(T)(-M5J/-M3J)



Note: The Timer Adjuster is only for the E3S-LS3PT and E3S-LS3PWT.

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.  
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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