Actuator-Type Photosensors
OS-5502/5515 • Built-in schmitt trigger circuit on a single chip

The OS-5502 and OS-5515 are high-performance photosensors consisting of unitized photo interruptor/actuators which feature a built-in Schmitt trigger circuit. The provision of an internal Schmitt trigger circuit reduces design time and provides advantages in terms of both space and cost. The digital output of these sensors enables them to be directly connected to such devices as microcomputer control systems. The OS-5515 is housed in an ultra-compact package, making it ideal for compact equipment designs.
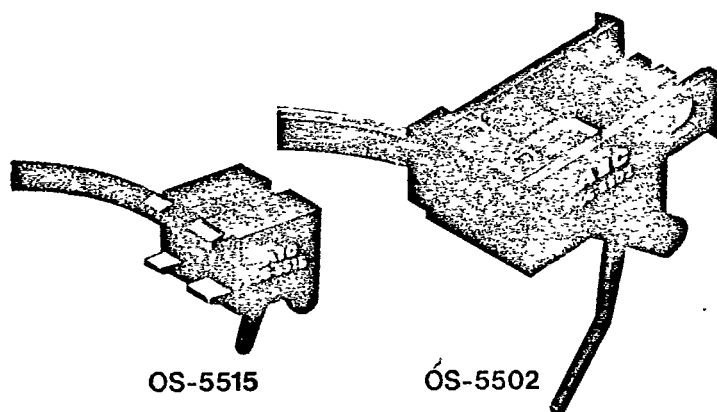
⊙ Features
- Unitized construction of sensor and moving portion ensures excellent detection effectiveness.
- Unitized construction simplifies design work and lowers costs.

- By unitizing the light-receiving element and surrounding signal processing circuitry, both a reduction in parts count and design simplicity have been achieved.
- Directly connectable to TTL, LSTTL and CMOS devices.
- Built-in Schmitt trigger circuit.
- Wide supply voltage range (V_{CC} = 4.5V ~ 16V)
- Compact design enhances the compactness of your equipment, and is usable in cramped quarters. (OS-5515)
- Small actuator operating torque makes those sensors ideal for detecting such light objects as moving paper or wafers.
- Actuator section configuration may be changed to suit special requirements.
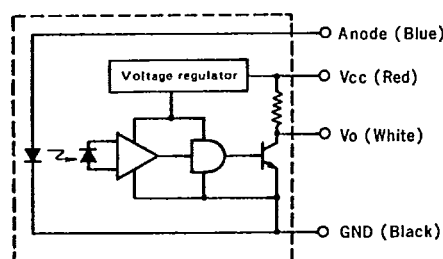
⊙ Applications
- Detection of paper movement and amount of remaining paper in copiers, printers, facsimile machines, printing equipment and other office automation products.
- Detection of the passage of paper currency and coins.
- Detection of the passage of wafers and frame-type parts.
- Detection of cassette tape and video tape insertion.
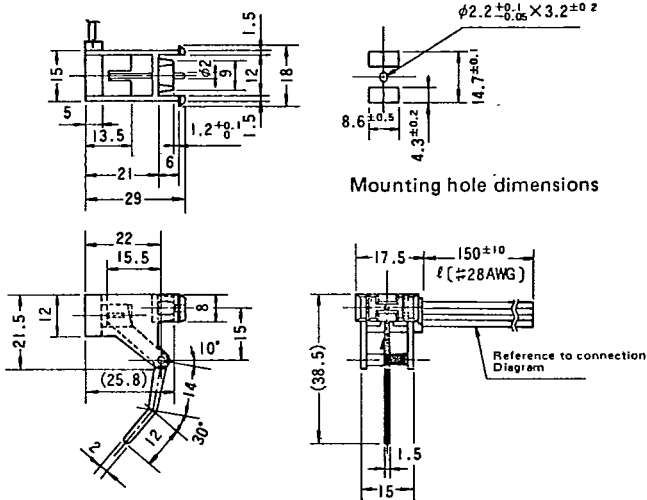- Rotational position detection of low-speed rotating bodies.
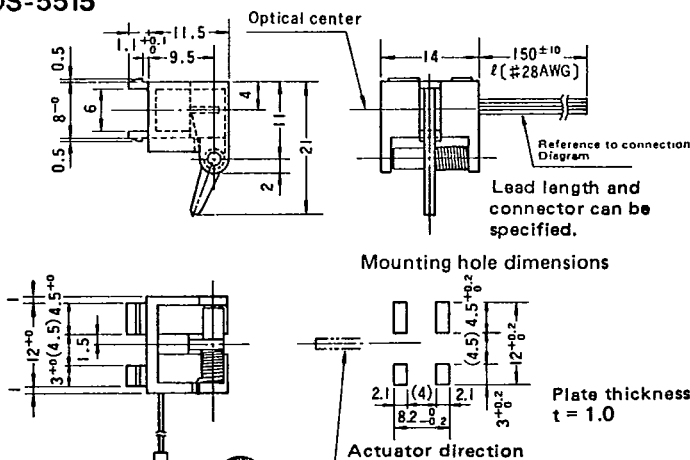

OS-5515   ÓS-5502

OS-5502   UNITS: MILLIMETER

$\phi 2.2^{+0.1}_{-0.05} \times 3.2^{\pm 0.2}$

Mounting hole dimensions

ℓ (≒28AWG)
Reference to connection Diagram

⊙ Connection Diagram

Voltage regulator	O Anode (Blue)
	O Vcc (Red)
	O Vo (White)
	O GND (Black)

OS-5515

Optical center

ℓ (≒28AWG)
Reference to connection Diagram

Lead length and connector can be specified.

Mounting hole dimensions

Plate thickness
t = 1.0

Actuator direction

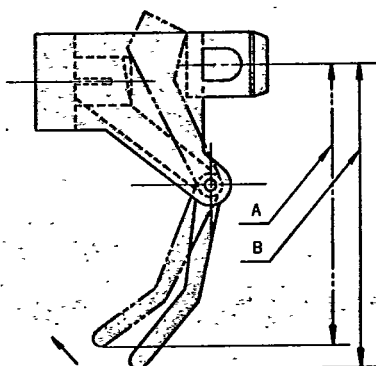OS-5502, 5515 Electrical characteristics are same as page 5 (OS-3502, 3602)
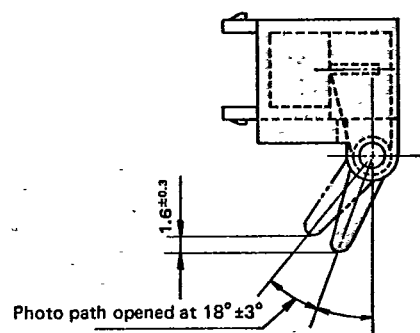
● Operating Characteristics

OS-5502

When the actuator is in its initial position, the photo path is blocked (OFF). When the actuator moves in the direction of the arrow so that A = 35.0mm in the figure at right, the photo path is opened (ON).

Initial position:
B = 38.2±1.0mm

OS-5515

Photo path opened at 18°±3°

● Absolute Maximum Ratings (Ta = 25°C)

	Parameter	Symbol	Value	Units
Light-emitting side	Forward current	I_F	50	mA
	Reverse voltage	V_R	5	V
Light-receiving side	Supply voltage	V_{CC}	16	V
	Low-level output current	I_{OL}	50	mA
	Allowable dissipation	P_0	250	mW

● Operating Condition Recommendable

Parameter	Symbol	Min.	Typ.	Max.	Units
Supply voltage	V_{CC}	4.5	5.0	*(16)	V
Forward current	I_F	11	13	15	mA
Operating temperature	T_{opr}	0	——	70	°C

*In case V_{CC} = 15V, R_L = ∞ recommendable.

● Mechanical Characteristics

Parameter	Limits
Actuator arm operating force	1 g·cm ± 0.5g·cm
Resistance to vibration	10~55Hz, Amp. 1.5mmp-p, 60 sec. X, Y, Z 3 directions per 3 min.
Resistance to shock	30G
Operating temperature range (Topr)	−25°C ～ +80°C
Storage temperature range (Tstg)	−30°C ～ +95°C

● Electrical Characteristics (Ta = 25°C)   0°C to 70°C unless otherwise noted.

	Parameter		Symbol	Test conditions	Min.	Typ.	Max.	Units
Light-emitting side	Forward voltage		V_F	I_F = 8mA	——	1.15	1.4	V
	Reverse current		I_R	V_R = 5V, Ta = 25°C	——	——	10	μA
Light-receiving side	Operating supply voltage range		V_{CC}	Ta = 25°C	4.5	——	16	V
	Low-level output voltage		V_{OL}	I_{OL} = 16mA, V_{CC} = 5V, I_F = 0	——	0.15	0.4	V
	High-level output voltage		V_{OH}	I_F = 8mA, V_{CC} = 5V	4.0	——	——	V
	Low-level supply current		I_{CCL}	I_F = 0, V_{CC} = 5V	——	6	15	mA
	High-level supply current		I_{CCH}	I_F = 8mA, V_{CC} = 5V	——	4	10	mA
Transmitting characteristics	Low-to-High-level threshold input current		I_{FLH}	V_{CC} = 5V, Ta = 25°C	——	2	5	mA
				V_{CC} = 5V	——	——	8	mA
	Hysteresis		I_{FHL}/I_{FLH}	V_{CC} = 5V	——	0.9	——	
	Switching time	Low-to-High-level propagation time	t_{PLH}	Ta = 25°C	——	3	——	μS
		High-to-Low-level propagation time	t_{PHL}	V_{CC} = 5V	——	5	——	
		Rise time	tr	I_F = 0↔8mA	——	0.1	——	
		Fall time	tf	R_L = 280Ω	——	0.05	——	