

## OS-5502/5515 • Built-in schmitt trigger circuit on a single chip

- 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.



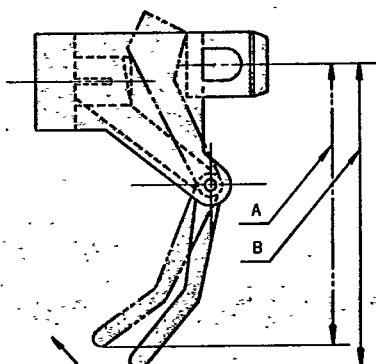
A-27-17

## ● Operating Characteristics

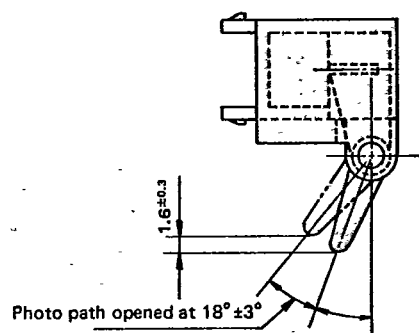
### OS-5502

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  $A = 35.0\text{mm}$  in the figure at right, the photo path is opened (ON).

Initial position:  
 $B = 38.2 \pm 1.0\text{mm}$



### OS-5515



## ● Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

| 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    | $P_O$    | 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     | $^\circ\text{C}$ |

\* In case  $V_{CC} = 15\text{V}$ ,  $R_L = \infty$  recommendable.

## ● Mechanical Characteristics

| Parameter                                 | Limits                                                           |
|-------------------------------------------|------------------------------------------------------------------|
| Actuator arm operating force              | 1 g·cm $\pm$ 0.5 g·cm                                            |
| Resistance to vibration                   | 10~55Hz, Amp. 1.5mm-p-p, 60 sec. X, Y, Z 3 directions per 3 min. |
| Resistance to shock                       | 30G                                                              |
| Operating temperature range ( $T_{opr}$ ) | $-25^\circ\text{C} \sim +80^\circ\text{C}$                       |
| Storage temperature range ( $T_{stg}$ )   | $-30^\circ\text{C} \sim +95^\circ\text{C}$                       |

## ● Electrical Characteristics ( $T_a = 25^\circ\text{C}$ )

$0^\circ\text{C}$  to  $70^\circ\text{C}$  unless otherwise noted.

| Parameter                    |                                           |                                    | Symbol            | Test conditions                                      | Min. | Typ. | Max. | Units         |
|------------------------------|-------------------------------------------|------------------------------------|-------------------|------------------------------------------------------|------|------|------|---------------|
| Light-emitting side          | Forward voltage                           |                                    | $V_F$             | $I_F=8\text{mA}$                                     | —    | 1.15 | 1.4  | V             |
|                              | Reverse current                           |                                    | $I_R$             | $V_R=5\text{V}$ , $T_a=25^{\circ}\text{C}$           | —    | —    | 10   | $\mu\text{A}$ |
| Light-receiving side         | Operating supply voltage range            |                                    | $V_{CC}$          | $T_a=25^{\circ}\text{C}$                             | 4.5  | —    | 16   | V             |
|                              | Low-level output voltage                  |                                    | $V_{OL}$          | $I_{OL}=16\text{mA}$ , $V_{CC}=5\text{V}$<br>$I_F=0$ | —    | 0.15 | 0.4  | V             |
|                              | High-level output voltage                 |                                    | $V_{OH}$          | $I_F=8\text{mA}$ , $V_{CC}=5\text{V}$                | 4.0  | —    | —    | V             |
|                              | Low-level supply current                  |                                    | $I_{CCL}$         | $I_F=0$ , $V_{CC}=5\text{V}$                         | —    | 6    | 15   | mA            |
|                              | High-level supply current                 |                                    | $I_{CCH}$         | $I_F=8\text{mA}$ , $V_{CC}=5\text{V}$                | —    | 4    | 10   | mA            |
| Transmitting characteristics | Low-to-High-level threshold input current |                                    | $I_{FLH}$         | $V_{CC}=5\text{V}$ , $T_a=25^{\circ}\text{C}$        | —    | 2    | 5    | mA            |
|                              |                                           |                                    |                   | $V_{CC}=5\text{V}$                                   | —    | —    | 8    | mA            |
|                              | Hysteresis                                |                                    | $I_{FHL}/I_{FLH}$ | $V_{CC}=5\text{V}$                                   | —    | 0.9  | —    |               |
|                              | Switching time                            | Low-to-High-level propagation time | $t_{PLH}$         | $T_a=25^{\circ}\text{C}$                             | —    | 3    | —    | $\mu\text{S}$ |
|                              |                                           | High-to-Low-level propagation time | $t_{PHL}$         | $V_{CC}=5\text{V}$                                   | —    | 5    | —    |               |
|                              |                                           | Rise time                          | $t_r$             | $I_F=0\leftrightarrow 8\text{mA}$                    | —    | 0.1  | —    |               |
|                              |                                           | Fall time                          | $t_f$             | $R_L=280\Omega$                                      | —    | 0.05 | —    |               |