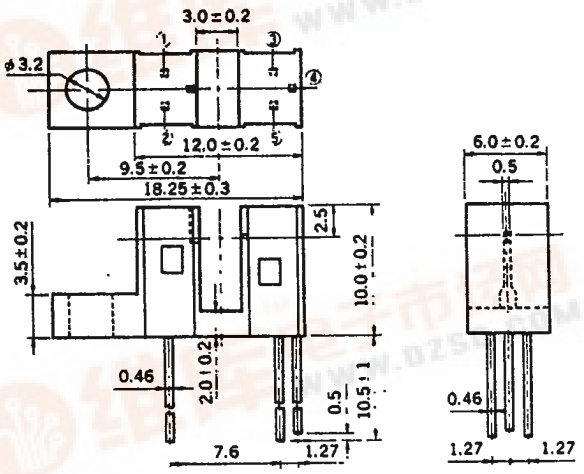
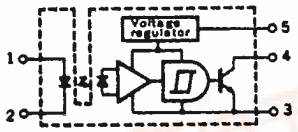
# PHOTO INTERRUPTER
# PS5002HC

## PHOTO IC INTERRUPTER

### PACKAGE DIMENSIONS (Unit : mm)




### CONNECTION DIAGRAM




1. Anode
2. Cathode
3. GND
4. $V_O$
5. $V_{CC}$

### APPLICATIONS

- PPC
- FACSIMILE
- PRINTER
- FDD

### DESCRIPTION

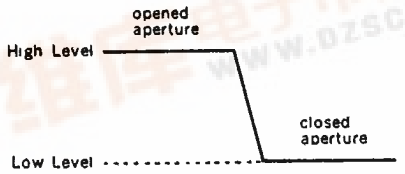
The PS5002HC photo interrupter module is a GaAs Light Emitting Diode coupled to a Si monolithic integrated circuit including a Photo Diode in a plastic housing.

The output incorporates a Schmitt Trigger circuit which provides hysteresis for noise immunity and pulse shaping.

### FEATURES

- Built-in Schmitt Trigger circuit
- Low threshold input current ($I_{FLH}$ = 5 mA MAX.)
- TTL, LSTTL, CMOS compatible
- Wide supply voltage capability ($V_{CC}$ = 4.5 to 17 V)
- High On/Off resolution (Slit width: 0.5 mm (equivalent to 0.5 mm□ aperture))
- High speed switching ($t_{PLH}$ ($t_{PHL}$) = 3 μs TYP. $t_r$ = 100 ns, $t_f$ = 50 ns TYP. @ $R_L$ = 280 Ω)
- Active "High"
- Open collector output

### OUTPUT PATTERN



# PS5002HC

## ABSOLUTE MAXIMUM RATINGS ($T_a$ = 25 °C)

| | | | |
|---|---|---|---|
| Diode | | | |
| Reverse Voltage | $V_R$ | 6 | V |
| Forward Current | $I_F$ | 50 | mA |
| Power Dissipation | $P_D$ | 75 | mW |
| Detector | | | |
| Supply Voltage | $V_{CC}$ | 17 | V |
| Output Voltage | $V_O$ | 28 | V |
| Low Level Output Current | $I_{OL}$ | 50 | mA |
| Power Dissipation | $P_C$ | 250 | mW |
| Storage Temperature | $T_{stg}$ | −40 to +100 | °C |
| Operating Temperature | $T_{opt}$ | −30 to +85 | °C |

## RECOMMENDED OPERATING CONDITIONS ($T_a$ = 25 °C)

| CHARACTERISTIC | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|
| Operating Temperature | $T_{opt}$ | −10 | | +60 | °C |
| Supply Voltage | $V_{CC}$ | 4.5 | 5 | 12 | V |
| Forward Current | $I_F$ | 5 | | 20 | mA |

## ELECTRICAL CHARACTERISTICS ($T_a$ = 25 °C)

| CHARACTERISTIC | | SYMBOL | MIN. | TYP. | MAX. | UNIT | TEST CONDITIONS |
|---|---|---|---|---|---|---|---|
| Diode | Forward Voltage | $V_F$ | | 1.1 | 1.4 | V | $I_F$ = 5 mA |
| | Reverse Current | $I_R$ | | | 10 | μA | $V_R$ = 5 V |
| | Junction Capacitance | $C_t$ | | 20 | | pF | V = 0, f = 1 MHz |
| Detector | Operating Supply Voltage | $V_{CC}$ | 4.5 | | 17 | V | |
| | Low Level Output Voltage | $V_{OL}$ | | 0.15 | 0.4 | V | $I_{OL}$ = 16 mA, $V_{CC}$ = 5 V |
| | High Level Output Voltage | $V_{OH}$ | 4.9 | | | V | $V_{CC}$ = 5 V, $I_F$ = 5 mA |
| | Low Level Supply Current | $I_{CCL}$ | | 2.5 | 5 | mA | $V_{CC}$ = 5 V, $I_F$ = 0 |
| | High Level Supply Current | $I_{CCH}$ | | 1 | 3 | mA | $V_{CC}$ = 5 V, $I_F$ = 5 mA |
| Coupled | Threshold Input Current | $I_{FLH}$ | | | 5 | mA | $V_{CC}$ = 5 V, $R_L$ = 280 Ω |
| | Hysteresis Ratio | $I_{FHL}/I_{FLH}$ | | 0.7 | | | $V_{CC}$ = 5 V, $R_L$ = 280 Ω |
| | Propagation Delay Time | $t_{PLH}$ | | 3 | 9 | μs | $V_{CC}$ = 5 V |
| | | $t_{PHL}$ | | 3 | 9 | μs | $I_F$ = 5 mA |
| | Rise Time | $t_r$ | | 100 | 300 | ns | $R_L$ = 280 Ω |
| | Fall Time | $t_f$ | | 50 | 150 | ns | |

Test Circuit for Switching Time