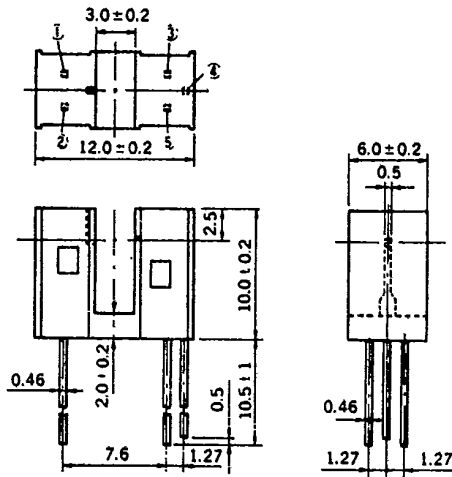


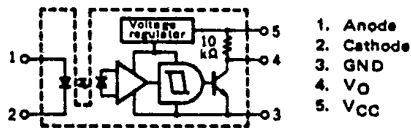
PHOTO INTERRUPTER PS5003LR

PHOTO IC INTERRUPTER

PACKAGE DIMENSIONS (Unit : mm)



CONNECTION DIAGRAM



APPLICATIONS

- PPC
- FACSIMILE
- PRINTER
- FDD

DESCRIPTION

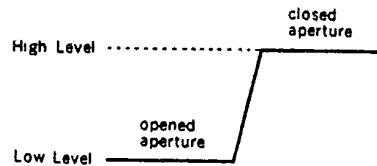
The PS5003LR photo interrupter module is a GaAs Light Emitting Diode coupled to a Si monolithic integrated circuit including a Photo Diode in a plastic housing.

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 ($I_{FHL} = 5 \text{ mA MAX.}$)
- TTL, LSTTL, CMOS compatible
- Wide supply voltage capability ($V_{CC} = 4.5 \text{ to } 17 \text{ V}$)
- High On/Off resolution (Slit width: 0.5 mm (equivalent to 0.5 mm² aperture))
- High speed switching ($t_{PHL} (t_{PLH}) = 3 \mu\text{s TYP.}$
 $t_r = 100 \text{ ns, } t_f = 50 \text{ ns TYP.}$
 $@ R_L = 280 \Omega$)
- Active "Low"
- Built-in pull up resistor

OUTPUT PATTERN



ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

| | | | |
|--------------------------|-----------|-------------|------------------|
| 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 |
| Low Level Output Current | I_{OL} | 50 | mA |
| Power Dissipation | P_C | 250 | mW |
| Storage Temperature | T_{stg} | -40 to +100 | $^\circ\text{C}$ |
| Operating Temperature | T_{opt} | -30 to +85 | $^\circ\text{C}$ |

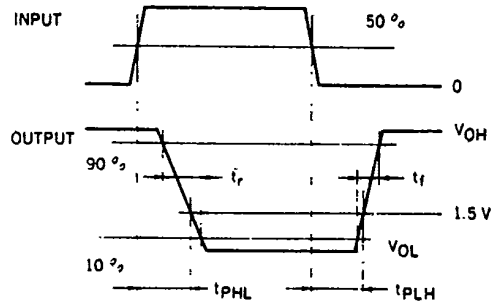
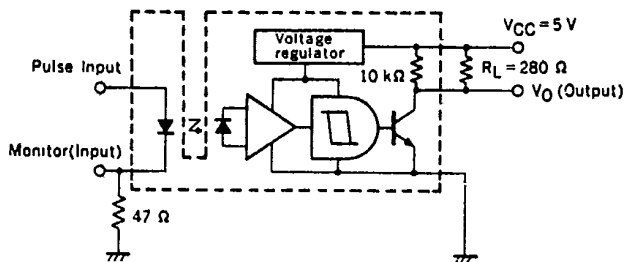
RECOMMENDED OPERATING CONDITIONS ($T_a = 25^\circ\text{C}$)

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

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

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

Test Circuit for Switching Time



2