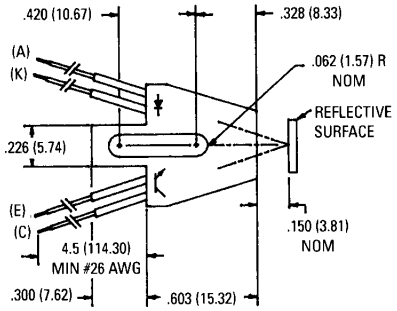
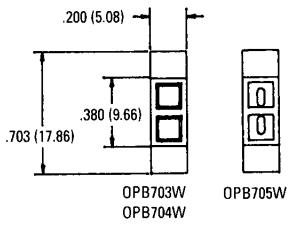
FAIRCHILD
SEMICONDUCTOR™

# REFLECTIVE OBJECT SENSORS

# OPB703W/OPB704W/OPB705W

## PACKAGE DIMENSIONS




| FUNCTION | WIRE COLOR |
|---|---|
| (C) COLLECTOR | WHITE |
| (E) EMITTER | BLUE |
| (K) CATHODE | GREEN |
| (A) ANODE | ORANGE |

NOTES
1. DIMENSIONS ARE IN INCHES (mm).
2. TOLERANCE IS ±.010 (.25)

OPB703W - IR TRANSPARENT DUST COVER
OPB704W - IR TRANSPARENT DUST COVER
OPB705W - OFFSET LENS

## DESCRIPTION

The OPB703W, OPB704W, and OPB705W consist of an infrared emitting diode and an NPN silicon phototransistor mounted side by side on a converging optical axis in a black plastic housing. The phototransistor responds to radiation from the emitting diode only when a reflective object passes within its field of view. The area of the optimum response approximates a circle .200" in diameter. Leads are 26 AWG, PVC insulation, 4.5" (114.3 mm) minimum length, stripped and tinned.

## FEATURES

- Phototransistor output.
- High Sensitivity.
- Low cost plastic housing.
- Pre wired with 4.5 inch, 26 gauge leads.
- OPB703W/OPB704W, dust cover; lens.
- OBP705W, offset lens.

## ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C Unless Otherwise Specified)

Storage Temperature ..... −40°C to + 85°C
Operating Temperature ..... −40°C to + 85°C
Soldering:
Lead Temperature (Iron) ..... 240°C for 5 sec. (2,3,4)
Lead Temperature (Flow) ..... 260°C for 10 sec. (2,3)

**INPUT DIODE**
Continuous Forward Current ..... 50 mA
Reverse Voltage ..... 5.0 Volts
Power Dissipation ..... 100 mW(1)

**OUTPUT TRANSISTOR**
Collector-Emitter Voltage ..... 30 Volts
Emitter-Collector Voltage ..... 5.0 Volts
Collector Current ..... 25 mA
Power Dissipation ..... 100 mW(1)

## ELECTRICAL CHARACTERISTICS ($T_A$ = 25°C Unless Otherwise Specified)

| PARAMETER | SYMBOL | MIN. | MAX. | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|
| **INPUT DIODE** | | | | | |
| Forward Voltage | $V_F$ | — | 1.70 | V | $I_F$ = 40 mA |
| Reverse Leakage Current | $I_R$ | — | 100 | μA | $V_R$ = 2.0 V |
| **OUTPUT TRANSISTOR** | | | | | |
| Emitter-Collector Breakdown | $BV_{ECO}$ | 5 | — | V | $I_E$ = 100 μA, Ee = 0 |
| Collector-Emitter Breakdown | $BV_{CEO}$ | 30 | — | V | $I_C$ = 100 μA, Ee = 0 |
| Collector-Emitter Leakage | $I_{CEO}$ | — | 100 | nA | $V_{CE}$ = 10.0 V, Ee = 0 |
| **COUPLED** | | | | | |
| On-State Collector Current | | | | | |
| OPB703W | $I_{C(ON)}$ | 200 | — | μA | $I_F$ = 40 mA, $V_{CE}$ = 5 V, D = .150" (5,6) |
| OPB704W | $I_{C(ON)}$ | 200 | — | μA | $I_F$ = 40 mA, $V_{CE}$ = 5 V, D = .150" (5,6) |
| OPB705W | $I_{C(ON)}$ | 100 | — | μA | $I_F$ = 40 mA, $V_{CE}$ = 5 V, D = .150" (5,6) |
| Crosstalk | $I_{CX}$ | — | 20 | μA | $I_F$ = 40 mA, $V_{CE}$ = 5 V(7) |

## NOTES

1. *Derate power dissipation linearly 1.67 mW/°C above 25°C.*
2. *RMA flux is recommended.*
3. *Methanol or Isopropyl alcohols are recommended as cleaning agents.*
4. *Soldering iron tip 1⁄16" (1.6 mm) from housing.*
5. *D is the distance from the assembly face to the reflective surface.*
6. *Measured using Eastman Kodak neutral test card with 90% diffused reflecting surface.*
7. *Cross talk is the photocurrent measured with current to the input diode and no reflective surface.*

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