

DESCRIPTION

The IF-D96F is a medium-speed photologic detector housed in a “connector-less” style plastic fiber optic package. The detector contains an IC with a photodiode, linear amplifier, voltage comparator, and Schmitt trigger logic circuit. The IF-D96F features an inverted open-collector Schottky transistor output (active low). The device can drive up to 5 TTL loads over output (pull-up) voltages ranging from 4.5 to 15 Volts. Optimized for visible wavelengths of 600 to 780 nm. The detector package features an internal micro-lens and a precision-molded PBT housing to ensure efficient optical coupling with standard 1000 μm core plastic fiber cable.

APPLICATION HIGHLIGHTS

The IF-D96F is suitable for digital data links at rates up to 5 Mbps. A Schmitt trigger improves noise immunity and TTL/CMOS logic compatibility greatly simplifies interfacing with existing digital circuits. An enhanced internal electrical architecture ensures stable operation and wide dynamic range. The integrated design of the IF-D96F provides simple, cost-effective implementation in a variety of digital applications.

APPLICATIONS

- Digital Data Links
- PC-to-Peripheral Links
- Process Control
- Digitized Audio
- Motor Controller Triggering
- Intra-System Links: Board-to-Board, Rack-to-Rack
- Medical Instruments
- Automotive Electronics
- Robotics Communications
- EMC/EMI Signal Isolation

FEATURES

- ◆ High Optical Sensitivity
- ◆ Mates with Standard 1000 μm Core Jacketed Plastic Fiber Optic Cable
- ◆ No Optical Design Required
- ◆ Inexpensive Plastic Connector Housing
- ◆ Internal Micro-Lens for Efficient Optical Coupling
- ◆ Connector-Less Fiber Termination
- ◆ Light-Tight Housing Provides Interference-Free Transmission
- ◆ Open Collector Output
- ◆ RoHS Compliant

MAXIMUM RATINGS

($T_A=25^\circ\text{C}$)

| | |
|---|---|
| Operating and Storage Temperature Range | (T_{OP} , T_{STG}).....-40° to 85°C |
| Soldering Temperature (2 mm from case bottom) | (T_S) $t_s \leq 5s$240°C |
| Supply Voltage, (V_S) |5 to 15 V |
| Voltage at Output lead |5 to 15 V |
| Sinking Current, DC (I_C) |25 mA |
| Open Collector Power Dissipation (P_O) $T_A=25^\circ\text{C}$ |80 mW |
| De-rate Above 25°C |1.33 mW/°C |

* Load = 620 Ohms

CHARACTERISTICS ($T_A=25^\circ\text{C}$) $V_{CC} = 4.75$ to 5.25 V unless otherwise specified

| Parameter | Symbol | Min | Typ | Max | Unit |
|---|------------------|------|------|------|---------------|
| Peak Sensitivity | λ_{PEAK} | - | 700 | - | nm |
| Spectral Sensitivity ($S=80\%$ of S_{MAX}) | $\Delta\lambda$ | 600 | - | 780 | nm |
| Recommended Operating Voltage | V_{CC} | 4.25 | - | 15.0 | V |
| High Level Supply Current $V_{CC}=5.25$ V * | I_{CCH} | - | 3.5 | 6 | mA |
| Low Level Supply Current $V_{CC}=5.25$ V * | I_{CCL} | - | 12 | 14.5 | mA |
| Light Level to Trigger ($R_L=1$ k Ω $\lambda=660$ nm) | $E_r (+)$ | - | 7 | - | μW |
| Light Level to Not Trigger ($\lambda=660$ nm) | $E_r (-)$ | - | 0.1 | - | μW |
| | | | -40 | | dBm |
| High Level Output Current $V_{OH}= 15$ V | I_{OH} | - | 5 | 100 | μA |
| Low Level Output Voltage ($I_{OL}= 8$ mA) | V_{OL} | - | 0.1 | 0.5 | V |
| Propagation Delay, Low-High ($f= 100.0$ kHz, $R_L= 5$ TTL Loads) | t_{PLH} | - | <250 | - | ns |
| Propagation Delay, High-Low ($f= 100.0$ kHz, $R= 5$ TTL Loads) | t_{PHL} | - | <100 | - | ns |

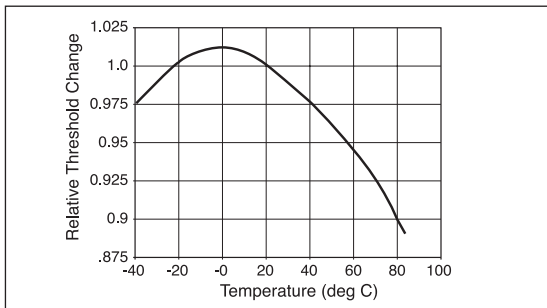


FIGURE 1. Normalized threshold irradiance vs. amb. temp.

FIBER TERMINATION INSTRUCTIONS

1. Cut off the ends of the optical fiber with a single-edge razor blade or sharp knife. Try to obtain a precise 90-degree angle (square).
2. Insert the fiber through the locking nut and into the connector until the core tip seats against the internal micro-lens.
3. Screw the connector locking nut down to a snug fit, locking the fiber in place.

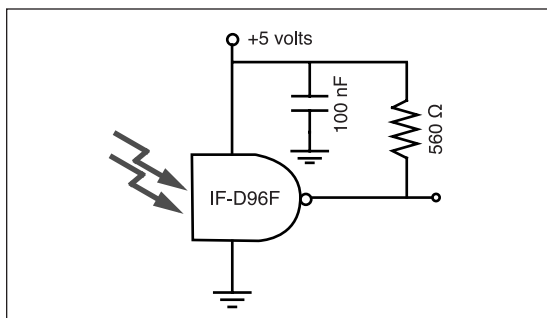
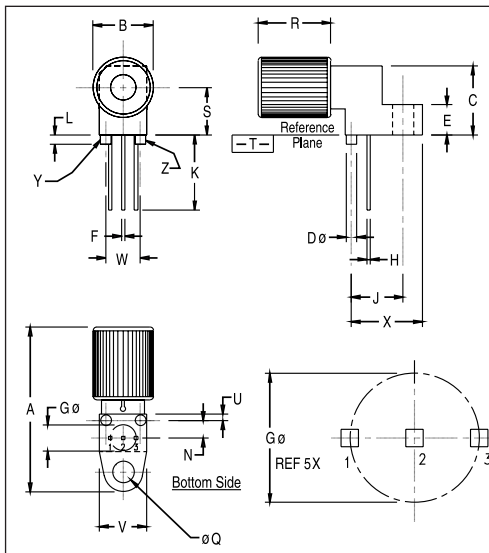


FIGURE 2. Typical operating circuit.



- NOTES:
1. Y AND Z ARE DATUM DIMENSIONS AND T IS A DATUM SURFACE.
 2. POSITIONAL TOLERANCE FOR D ϕ (2 PL):
 $\phi 0.25 (0.010) \text{ (M) } | \text{ T } | \text{ Y (M) } | \text{ Z (M) }$
 3. POSITIONAL TOLERANCE FOR F DIM (2 PL):
 $\phi 0.25 (0.010) \text{ (M) } | \text{ T } | \text{ Y (M) } | \text{ Z (M) }$
 4. POSITIONAL TOLERANCE FOR H DIM (2 PL):
 $\phi 0.25 (0.010) \text{ (M) } | \text{ T } | \text{ Y (M) } | \text{ Z (M) }$
 5. POSITIONAL TOLERANCE FOR Q ϕ :
 $\phi 0.25 (0.010) \text{ (M) } | \text{ T } | \text{ Y (M) } | \text{ Z (M) }$
 6. POSITIONAL TOLERANCE FOR B:
 $\phi 0.25 (0.010) \text{ (M) } | \text{ T }$
 7. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 8. CONTROLLING DIMENSION: INCH

PACKAGE IDENTIFICATION:

- ◆ IF-D96F—Black housing w/ Blue dot
- PIN 1. Ground
- PIN 2. Output
- PIN 3. V_{CC}

| DIM | MILLIMETERS | | INCHES | |
|-----|-------------|-------|----------|------|
| | MIN | MAX | MIN | MAX |
| A | 23.24 | 25.27 | .915 | .995 |
| B | 8.64 | 9.14 | .340 | .360 |
| C | 9.91 | 10.41 | .390 | .410 |
| D | 1.52 | 1.63 | .060 | .064 |
| E | 4.19 | 4.70 | .165 | .185 |
| F | 0.43 | 0.58 | .017 | .023 |
| G | 3.81 BSC | | .150 BSC | |
| H | 0.43 | 0.58 | .017 | .023 |
| J | 7.62 BSC | | .300 BSC | |
| K | 10.35 | 11.87 | .408 | .468 |
| L | 1.14 | 1.65 | .045 | .065 |
| N | 2.54 BSC | | .100 BSC | |
| Q | 3.05 | 3.30 | .120 | .130 |
| R | 10.48 | 10.99 | .413 | .433 |
| S | 6.98 BSC | | .275 BSC | |
| U | 0.83 | 1.06 | .032 | .042 |
| V | 6.86 | 7.11 | .270 | .280 |
| W | 5.08 BSC | | .200 BSC | |
| X | 10.10 | 10.68 | .397 | .427 |

FIGURE 3. Case outline.