

## DESCRIPTION

The IF-D96 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 and Schmitt trigger logic circuit. The IF-D96 features an inverted open-collector Schottky transistor (active low). The device can drive up to 5 TTL loads over output (pull-up) voltages ranging from 4.5 to 18 Volts. Optical response extends from 400 to 1100 nm, making it compatible with a wide range of LED and laser diode sources. The detector package features an internal micro-lens and a precision-molded PBT housing to ensure efficient optical coupling with standard 1000  $\mu$ m core plastic fiber cable.

## APPLICATION HIGHLIGHTS

The IF-D96 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. The integrated design of the IF-D96 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  $\mu$ m 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

## MAXIMUM RATINGS

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

Operating and Storage  
Temperature Range  
( $T_{OP}$ ,  $T_{STG}$ ) .....  $-40^\circ$  to  $85^\circ\text{C}$

Soldering Temperature  
(2 mm from case bottom)  
( $T_S$ )  $t \leq 5s$  .....  $240^\circ\text{C}$

Supply Voltage, ( $V_S$ ) .....  $.5$  to  $7\text{ V}$

Voltage at Output lead .....  $.5$  to  $18\text{ V}$

Sinking Current, DC ( $I_C$ ) .....  $25\text{ mA}$

Open Collector Power Dissipation  
( $P_{TOT}$ )  $T_A = 25^\circ\text{C}$  .....  $40\text{ mW}$

De-rate Above  $25^\circ\text{C}$  .....  $1.33\text{ mW}/^\circ\text{C}$

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

Parameter	Symbol	Min	Typ	Max	Unit
Peak Sensitivity	$\lambda_{PEAK}$	–	850	–	nm
Spectral Sensitivity ( $S = 10\%$ of $S_{MAX}$ )	$\Delta\lambda$	400	–	1100	nm
Operating Voltage	$V_{CC}$	–	–	5.5	V
High Level Supply Current $V_{CC} = 5.25\text{ V}$	$I_{CCL}$	–	3.5	6.3	mA
Low Level Supply Current $V_{CC} = 5.25\text{ V}$	$I_{CCL}$	–	6.2	10	mA
Light Required to Trigger ( $V_{CC} = 5\text{ V}$ , $R_L = 1\text{ k}\Omega$ $\lambda = 660\text{ nm}$ )	$E_T (+)$	–	3.5	–	$\mu\text{W}$
		–	24.5	–	dBm
High Level Output Current $V_{OH} = 18\text{ V}$	$I_{OH}$	–	5	250	$\mu\text{A}$
Low Level Output Voltage ( $I_{OL} = 8\text{ mA}$ )	$V_{OL}$	–	0.4	.5	V
Propagation Delay, Low-High ( $f = 100.0\text{ kHz}$ , $R_L = 5\text{ TTL Loads}$ )	$t_{PLH}$	–	65	–	ns
Propagation Delay, High-Low ( $f = 100.0\text{ kHz}$ , $R = 5\text{ TTL Loads}$ )	$t_{PHL}$	–	49	–	ns

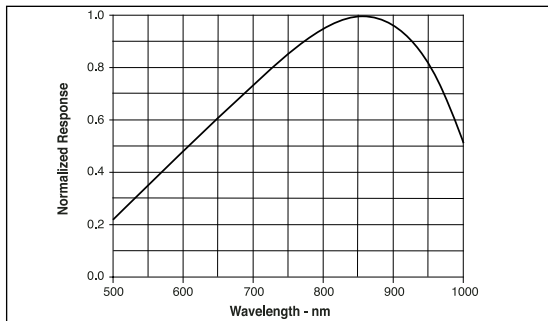


FIGURE 1. Typical detector response versus wavelength.

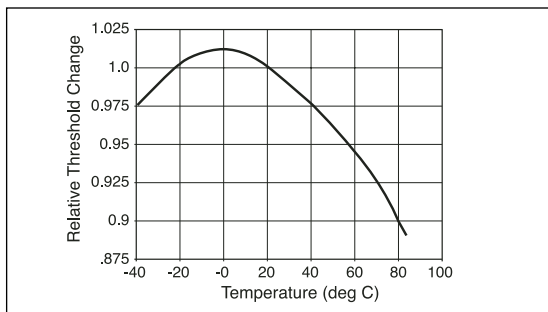


FIGURE 2. Normalized threshold irradiance vs. amb. temp.

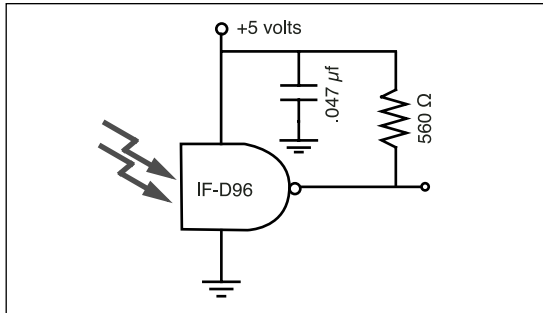
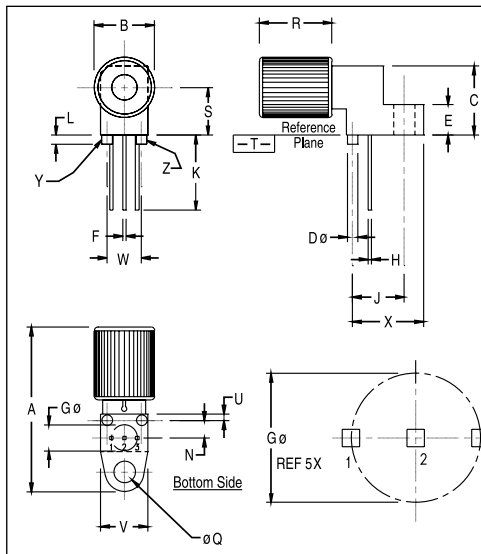


FIGURE 3. Typical operating circuit.

## 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.



### NOTES:

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

### PACKAGE IDENTIFICATION:

- ◆ D96—Black housing w/ Silver dot
- PIN 1. Ground
- PIN 2. Output
- PIN 3.  $V_{CC}$

	MILLIMETERS		INCHES	
DIM	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 4. Case outline.