



## DESCRIPTION

The IF-D98 is a very high-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 featuring an PECL logic compatible totem-pole output. Optical response of the IF-D98 extends from 400 to 1050 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 ensures efficient optical coupling with standard 1000 μm core plastic fiber cable.

## APPLICATION HIGHLIGHTS

The fast transition times of the IF-D98 make it suitable for high-speed digital data links. Link distances in excess of 75 meters at data rates of 155 Mbps are possible using standard 1000 μm core plastic fiber and an IF-E99 LED. The integrated design of the IF-D98 provides simple, cost-effective implementation in a variety of digital applications.

## APPLICATIONS

- ▶ PC-to-Peripheral Data Links
- ▶ Motor Controller Triggering
- ▶ Ethernet LANs
- ▶ Medical Instruments
- ▶ Automotive Electronics
- ▶ Digitized Video and HDTV
- ▶ Sonet/SDH Receivers
- ▶ Robotics Communications
- ▶ Isolation from Lightning and Voltage Transients

## FEATURES

- ◆ No Optical Design Required
- ◆ Mates with Standard 1000 μm Core Jacketed Plastic Fiber Cable
- ◆ Internal Micro-Lens for Efficient Coupling
- ◆ Inexpensive Plastic Connector Housing
- ◆ Connector-Less Fiber Termination and Connection
- ◆ Interference-Free Transmission from Light-Tight Housing
- ◆ Totem-Pole Output

## MAXIMUM RATINGS

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

Operating Temperature Range ( $T_{OP}$ ) .....	-20° to 70°C
Storage Temperature Range ( $T_{STG}$ ) .....	-40° to 85°C
Soldering Temperature (2 mm from case bottom) ( $T_S$ ) $t \leq 5s$ .....	240°C
Supply Voltage, ( $V_S$ ) .....	-5 to 7 V
Power Dissipation ( $P_{TOT}$ ) $T_A=25^\circ\text{C}$ .....	250 mW
De-rate Above 25°C .....	1.7 mW/°C

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

Parameter	Symbol	Min	Typ	Max	Unit
Peak Sensitivity	$\lambda_{PEAK}$	-	800	-	nm
Spectral Sensitivity ( $S=10\%$ of $S_{MAX}$ )	$\Delta\lambda$	400		1050	nm
Operating Voltage	$V_{CC}$	4.75	5	5.25	V
Supply Current	$I_{CC}$	-	-	40	mA
Light Required to Trigger <sup>1, 2, 3, 4, 5</sup> ( $V_{CC}=5\text{ V}$ , $\lambda=660\text{ nm}$ )	$E_r (+)$	-	6.3 -22	-	μW dBm
High Level Output Voltage <sup>1, 2, 5</sup> ( $I_{OH} = -1\text{ mA}$ )	$V_{OH}$	3.9	-	4.3	V
Low Level Output Voltage <sup>1, 2, 5</sup> ( $I_{OL} = -0.5\text{ mA}$ )	$V_{OL}$	2.9	-	3.4	V
Output Rise and Fall Times <sup>1, 2, 5</sup>	$t_r, t_f$	-	-	3	ns
Data Rate <sup>6, 7</sup>	$f_D$	4	-	156	Mbps
Pulse Width Distortion	$\Delta t$	-3	-	3	ns
Jitter	$\Delta t_j$	-	-	3	ns

### NOTES:

1. Input signal at 156 Mbps (Bi-phase signal)
2. 3 pF capacitor as load (including parasitic capacitance such as probes, connectors, and PCB patterns)
3. Optical input waveform is generated with IF-E99 LED

4. Average value, measured using plastic fiber (MH4001 by Mitsubishi Rayon)
5. 3 kΩ resistor externally connected to Q and  $\bar{Q}$
6. Bi-phase signal; NRZ conversion
7. No transition with DC light, no light, and modulated light below 4 Mbps



# Plastic Fiber Optic 155 Mbps Photologic Detector

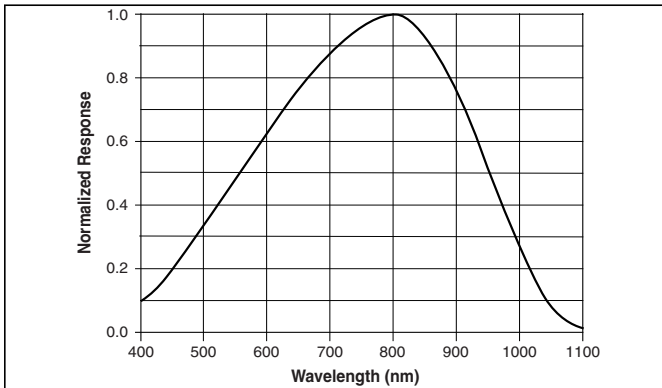


FIGURE 1. Typical detector response versus wavelength.

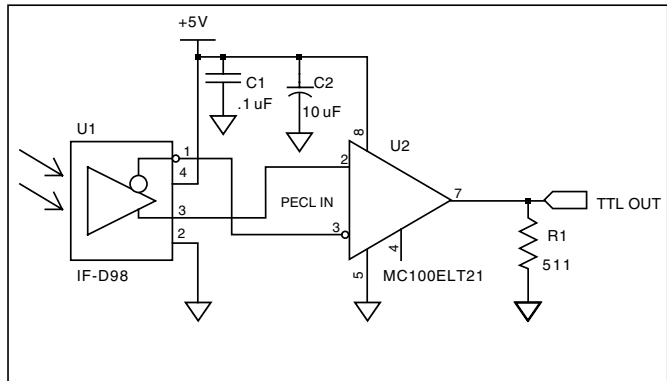


FIGURE 3. Typical interface circuit.

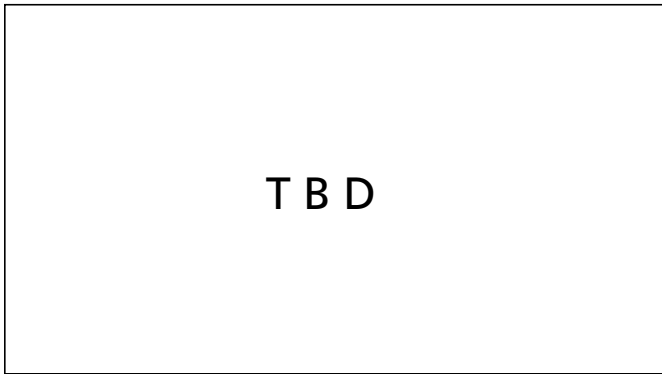


FIGURE 2. Normalized threshold irradiance vs. amb. temp.

## 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.

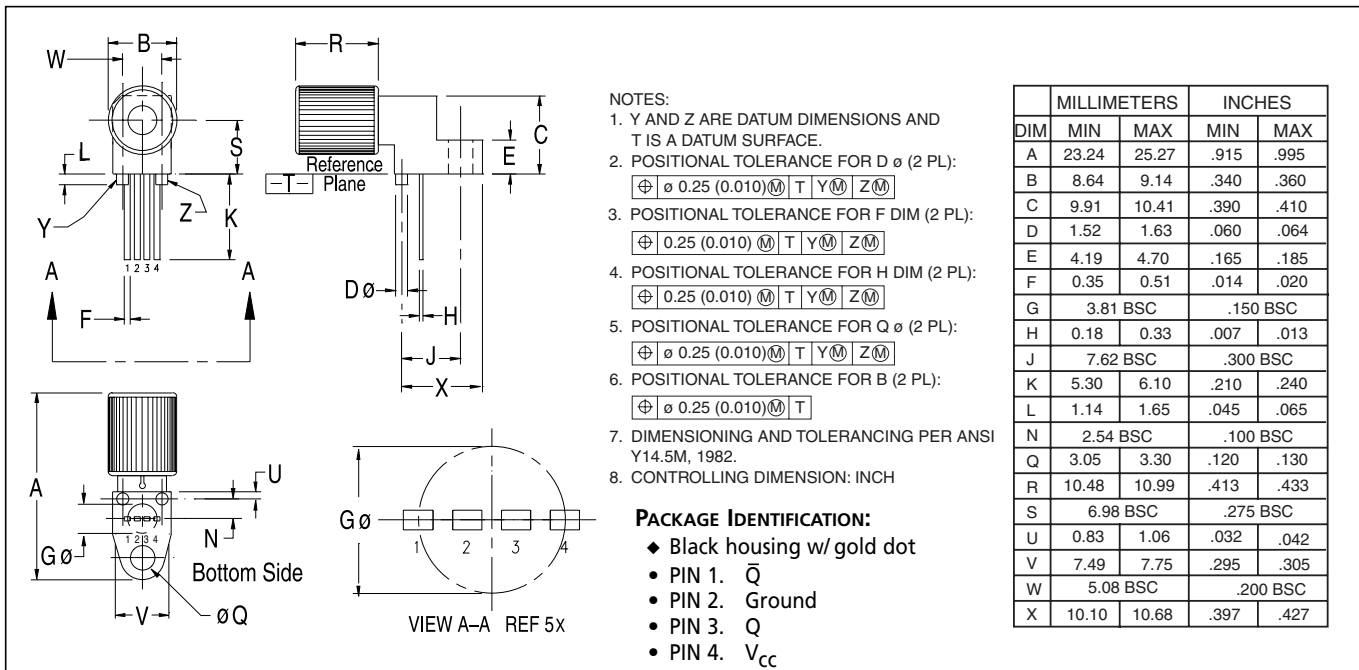


FIGURE 4. Case outline.