



## DESCRIPTION

The IF-D95T and IF-D95OC are photologic detectors 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-D95T features a TTL/CMOS compatible totem-pole output, while the IF-D95OC has an open-collector output. The devices can drive up to 5 TTL loads over supply voltages ranging from 4.5 to 16 Volts. Optical response extends from 400 to 1100 nm making them compatible with a wide range of visible and near infrared LED and laser diode sources. The detector package features an internal micro-lens, and a precision molded PBT housing to ensure efficient optical coupling into standard 1000  $\mu\text{m}$  core plastic fiber cable.

## APPLICATION HIGHLIGHTS

The IF-D95T and IF-D95OC are suitable for digital data links at rates up to 125 kbps. A Schmitt trigger improves noise immunity and TTL/CMOS logic compatibility greatly simplifies interfacing with existing digital circuits. The integrated design of the IF-D97 provides a total, cost effective solution in a variety of digital applications.

## APPLICATIONS

- Digital Data Links
- PC-to-Peripheral Links
- Process Control
- Household Appliances
- Motor Controller Triggering
- Electronic Games
- Medical Instruments
- Automotive Electronics
- Robotics Communications
- EMC/EMI Signal Isolation

## FEATURES

- ◆ Integrated Photodetector, Amplifier and Schmitt Trigger
- ◆ Mates with Standard 1000  $\mu\text{m}$  Core Jacketed Plastic Fiber Optic Cable
- ◆ No Optical Design Required
- ◆ Inexpensive But Rugged Plastic Connector Housing
- ◆ Internal Micro-Lens for Efficient Optical Coupling
- ◆ Connector-Less Fiber Termination
- ◆ Light-Tight Housing provides Interference Free Transmission
- ◆ High Optical Sensitivity
- ◆ *Active Low Output Option Available as Special Order*

## MAXIMUM RATINGS

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

|                                                                                 |              |
|---------------------------------------------------------------------------------|--------------|
| Operating and Storage Temperature Range<br>( $T_{OP}$ , $T_{STG}$ ).....        | -40° to 85°C |
| Soldering Temperature<br>(2 mm from case bottom)<br>( $T_S$ ) $t \leq 5s$ ..... | 240°C        |
| Supply Voltage, ( $V_S$ ).....                                                  | 18 V         |
| Voltage at Output lead<br>(IF-95OC only) .....                                  | 35 V         |
| Sinking Current, DC ( $I_C$ ) .....                                             | 50 mA        |
| Source Current ( $I_O$ )<br>(IF-95T only) .....                                 | 10 mA        |
| Power Dissipation<br>( $P_{TOT}$ ) $T_A = 25^\circ\text{C}$ .....               | 100 mW       |
| De-rate Above 25°C .....                                                        | 1.33 mW/°C   |

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

| Parameter                                                                                        | Symbol                | Value        | Unit               |
|--------------------------------------------------------------------------------------------------|-----------------------|--------------|--------------------|
| Peak Sensitivity                                                                                 | $\lambda_{PEAK}$      | 800          | nm                 |
| Spectral Sensitivity ( $S=10\%$ of $S_{MAX}$ )                                                   | $\Delta\lambda$       | 400-1100     | nm                 |
| Operating Voltage (max)                                                                          | $V_{CC}$              | 16           | V                  |
| Supply Current (max)                                                                             | $I_{CC}$              | 12           | mA                 |
| Light Required to Trigger $V_{CC}=5\text{ V}$ , $R_L=1k$ , $\lambda=660\text{ nm}$               | $E_r (+)$             | 1.0 (-30)    | $\mu\text{W(dBm)}$ |
| IF-D95T – High Level Output Voltage ( $I_{OH} = -1.0\text{ }\mu\text{A}$ )                       | $V_{OH}$              | $V_{CC}-2.1$ | V                  |
| Low Level Output Voltage ( $I_{OH} = 16\text{ mA}$ )                                             | $V_{OL}$              | 0.34         | V                  |
| Output Rise and Fall Times<br>( $f = 10.0\text{ kHz}$ , $R_L = 10\text{ TTL Loads}$ ) (max)      | $t_r$ , $t_f$         | 70           | ns                 |
| Propagation Delay, Low-High, High-Low<br>( $f = 10.0\text{ kHz}$ , $R_L = 10\text{ TTL Loads}$ ) | $t_{PLH}$ , $t_{PHL}$ | 8.0          | $\mu\text{s}$      |
| IF-D95OC – High Level Output Current ( $V_{OH}=30\text{ V}$ )                                    | $I_{OH}$              | 100          | $\mu\text{A}$      |
| Low Level Output Voltage ( $I_{OL}=16\text{ mA}$ )                                               | $V_{OL}$              | 0.4          | V                  |
| Output Rise and Fall Times<br>( $f = 10.0\text{ kHz}$ , $R_L = 300\Omega$ ) (max)                | $t_r$ , $t_f$         | 100          | ns                 |
| Propagation Delay, Low-High, High-Low<br>( $f = 10.0\text{ kHz}$ , $R_L = 300\Omega$ )           | $t_{PLH}$ , $t_{PHL}$ | 8.0          | $\mu\text{s}$      |

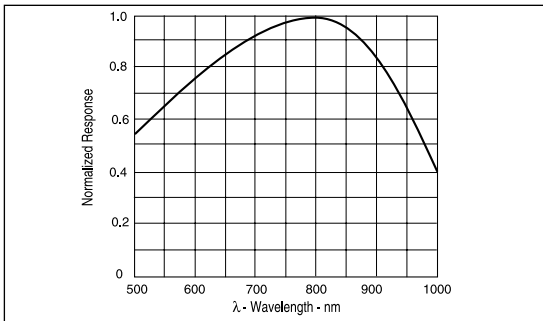


FIGURE 1. Typical detector response versus wavelength.

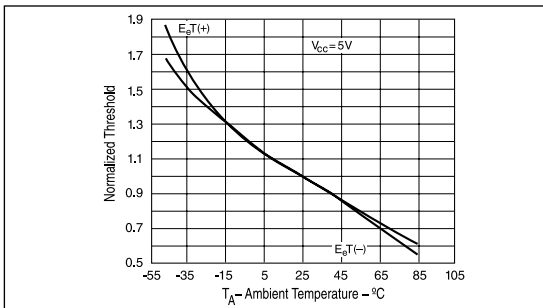


FIGURE 2. Normalized threshold irradiance vs. amb. temp.

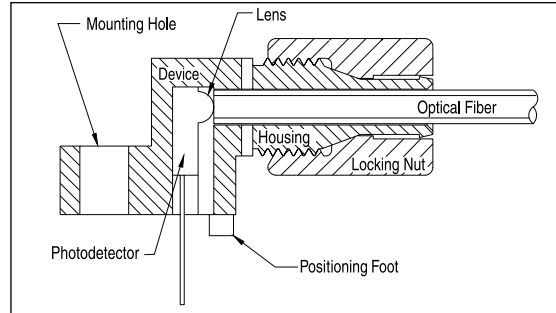


FIGURE 3. Cross-section of fiber optic device.

## 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.

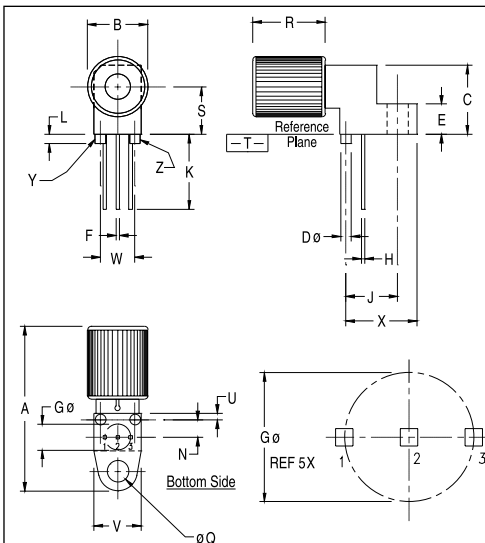


FIGURE 4. Case outline.

### Notes:

1. Y AND Z ARE DATUM DIMENSIONS AND T IS A DATUM SURFACE.
2. POSITIONAL TOLERANCE FOR D Ø (2 PL):  
 $\phi 0.25(0.010) \text{ M } | \text{ T } | \text{ Y } | \text{ Z } | \text{ M }$
3. POSITIONAL TOLERANCE FOR F DIM (2 PL):  
 $\phi 0.25(0.010) \text{ M } | \text{ T } | \text{ Y } | \text{ Z } | \text{ M }$
4. POSITIONAL TOLERANCE FOR H DIM (2 PL):  
 $\phi 0.25(0.010) \text{ M } | \text{ T } | \text{ Y } | \text{ Z } | \text{ M }$
5. POSITIONAL TOLERANCE FOR Q Ø:  
 $\phi 0.25(0.010) \text{ M } | \text{ T } | \text{ Y } | \text{ Z } | \text{ M }$
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:

- ◆ D95T—Black housing w/ Yellow dot
- ◆ D95OC—Black housing w/ Brown 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   | .305        | 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 |