



DESCRIPTION

The IF-D95T and IF-D95OC are high-sensitivity photologic detectors housed in “connector-less” style plastic fiber optic packages. 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 with standard 1000 μm 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-D95 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 μm 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 Options Available as Special Order
- ◆ The IF-D95OC is 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)	18 V
Voltage at Output lead (IF-95OC only)	35 V
Sinking Current, DC (I_C)	50 mA
Source Current (I_O) (IF-95T only)	10 mA
Power Dissipation (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	Min	Typ	Max	Unit
Peak Sensitivity	λ_{PEAK}	-	800	-	nm
Spectral Sensitivity ($S=10\%$ of S_{MAX})	$\Delta\lambda$	400	-	1100	nm
Operating Voltage	V_{CC}	4.5	-	16	V
Supply Current	I_{CC}	-	-	12	mA
Light Required to Trigger $V_{CC}=5\text{ V}, R_L=1\text{ k}, \lambda=660\text{ nm}$	$E_r (+)$	-	1.0 (-30)	-	$\mu\text{W(dBm)}$
IF-D95T					
High Level Output Voltage ($I_{OH} = -1.0\ \mu\text{A}$)	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 ($f = 10.0\ \text{kHz}, R_L = 10\ \text{TTL Loads}$)	t_r, t_f	-	-	70	ns
Propagation Delay, Low-High, High-Low ($f = 10.0\ \text{kHz}, R_L = 10\ \text{TTL Loads}$)	t_{PLH}, t_{PHL}	-	8.0	-	μs
IF-D95OC					
High Level Output Current ($V_{OH}=30\ \text{V}$)	I_{OH}	100	-	-	μA
Low Level Output Voltage ($I_{OL}=16\ \text{mA}$)	V_{OL}	-	-	0.4	V
Output Rise and Fall Times ($f = 10.0\ \text{kHz}, R_L = 300\ \Omega$)	t_r, t_f	-	-	100	ns
Propagation Delay, Low-High, High-Low ($f = 10.0\ \text{kHz}, R_L = 300\ \Omega$)	t_{PLH}, t_{PHL}	-	8.0	-	μs

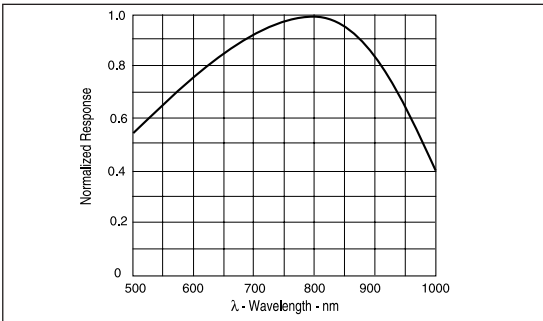


FIGURE 1. Typical detector response versus wavelength.

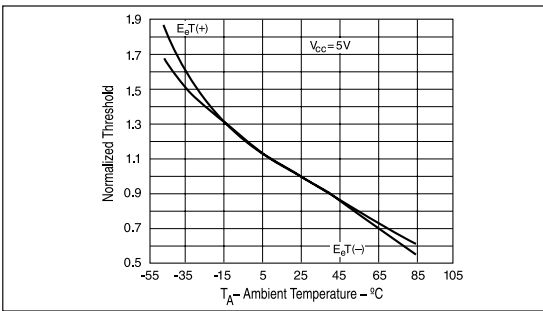


FIGURE 2. Normalized threshold irradiance vs. amb. temp.

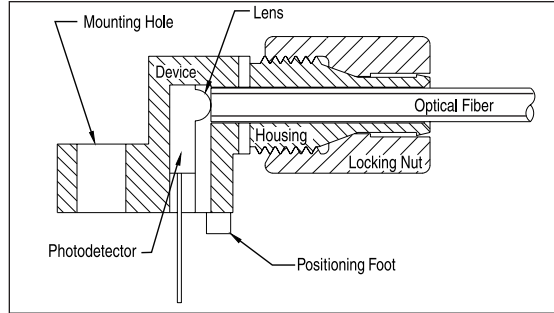


FIGURE 3. Cross-section of fiber optic device.

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.

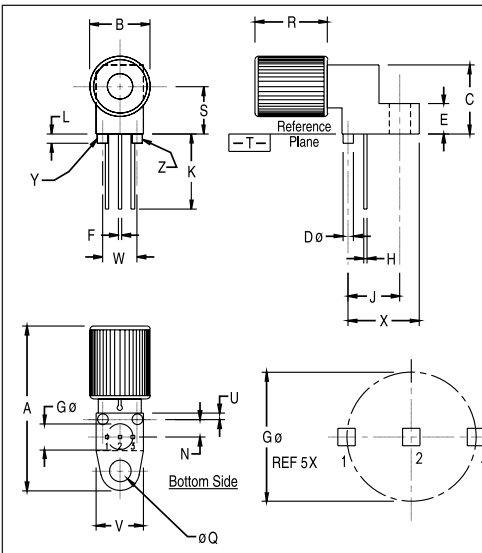


FIGURE 4. Case outline.

NOTES:

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