Plastic Fiber Optic Photologic Detectors IF D95

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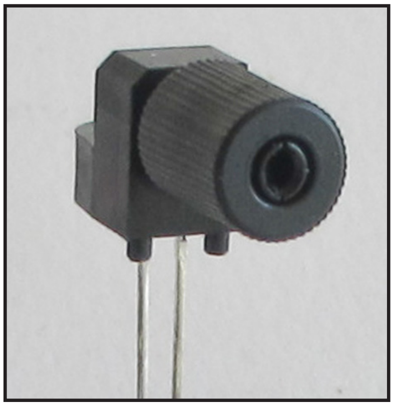


Description

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*
- RoHS Compliant

Maximum Ratings

(T_A =25°C)

Operating and Storage Temperature Range (T_{OP}, T_{STG})...............-40°to 85°C

Soldering Temperature (2mm from case bottom) (T_S) t ≤ 5 s..........................240°C

Supply Voltage, (V_S) ....16 V

Voltage at Output lead (IF-95OC only) ....30 V

Sinking Current, DC (I_C) ......50 mA

Source Current (I_O) (IF-95T only) ....10 mA

Power Dissipation (P_{TOT}) T_A=25°C ....100 mW

De-rate Above 25°......2.50 mW/°C

Characteristics (T_A =25°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}	–	-	6	mA
Light Required to Trigger V_{CC}=5 V, R_L=1k, λ=660 nm	Er (+)	–	1.0 (-30)	-	µW/(dBm)
IF-D95T High Level Output Voltage (I_{OH}= -1.0 µA)	V_{OH}	V_{CC}-2.1	-	-	V
Low Level Output Voltage (I_{OH}= 16 mA)	V_{OL}	-	-	0.34	V
Output Rise and Fall Times (f= 10.0 kHz, R_L= 10 TTL Loads)	t_r, t_f	-	-	70	ns
Propagation Delay, Low-High, High-Low (f= 10.0 kHz, RL= 10 TTL Loads)	t_{PLH},t_{PHL}	-	8.0	-	µs
IF-D95OC High Level Output Current (V_{OH}=30 V)	I_{OH}	-	-	100	µA
Low Level Output Voltage (I_{OL}=16 mA)	I_{OL}	-	-	0.4	V
Output Rise and Fall Times (f= 10.0 kHz, R_L=360Ω)	t_r, t_f	-	-	100	ns
Propagation Delay, Low-High, High-Low (f= 10.0 kHz, R_L=360Ω)	t_{PLH},t_{PHL}	-	6.0	-	µs

CAUTION: The IF D95 is ESD sensitive. To minimize risk of damage observe appropriate precautions during handling and processing.

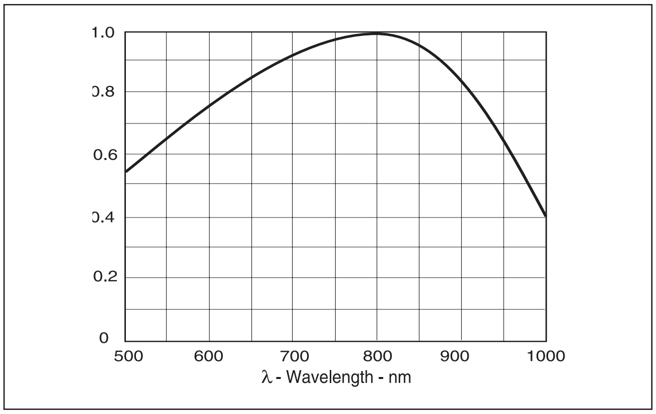


FIGURE 1. Normalized detector response versus wavelength.

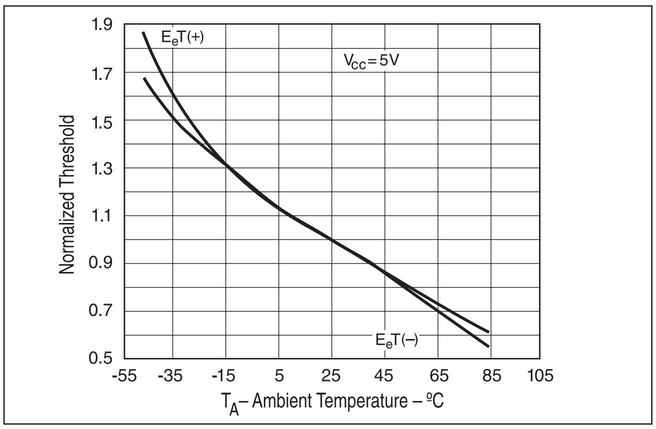


FIGURE 2. Normalized threshold irradiance vs. amb. temp.

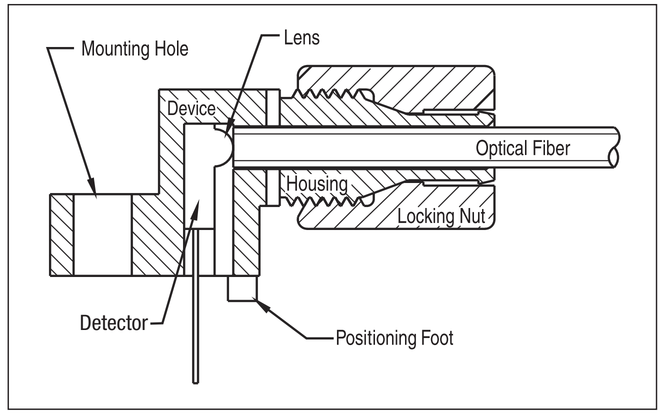
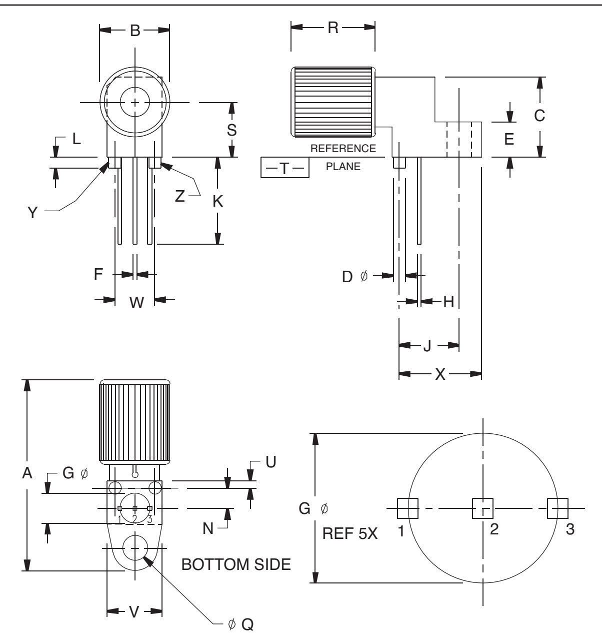


FIGURE 3. Cross-section of fiber optic device.

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.



NOTES:
1. Y AND Z ARE DATUM DIMENSIONS AND T IS A DATUM SURFACE.
2. POSITIONAL TOLERANCE FOR D ø (2 PL):
   ⊕ | ø 0.25 (0.010)Ⓜ | T | YⓂ | ZⓂ
3. POSITIONAL TOLERANCE FOR F DIM (2 PL):
   ⊕ | 0.25 (0.010) Ⓜ | T | YⓂ | ZⓂ
4. POSITIONAL TOLERANCE FOR H DIM (2 PL):
   ⊕ | 0.25 (0.010) Ⓜ | T | YⓂ | ZⓂ
5. POSITIONAL TOLERANCE FOR Q ø:
   ⊕ | ø 0.25 (0.010)Ⓜ | T | YⓂ | ZⓂ
6. POSITIONAL TOLERANCE FOR B:
   ⊕ | ø 0.25 (0.010)Ⓜ | 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}

	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	3.81BSC		.150BSC	
H	0.43	0.58	.017	.023
J	7.62 BSC		.300 BSC	
K	MIN 9.0		MIN .35	
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.

CAUTION:
- To avoid degraded device life due to package stress, do not bend or form leads outside the orientation shown on drawing.
- Ensure that solder flux does not migrate into the device and block the optical path, degrading the performance.
- If washing the device, liquid may become trapped in the part cavity. Ensure that all potentially corrosive materials are flushed out of the device.