



DESCRIPTION

The IF-D92 is the phototransistor in Industrial Fiber Optics' family of low-cost, medium-frequency, short-distance fiber optic LEDs and detectors. Each device consists of a polycarbonate (PC) housing which retains the internal active element such as an LED or photodetector subcomponent, and a cinch nut to hold the fiber in place. The assembly optimizes coupling between the active element and jacketed 1000 μm plastic fiber.

Working with this family of fiber optics requires no special tools or training. Only a sharp knife or razor blade is needed to terminate the plastic fiber. When the fiber is inserted in the LED or detector housing, the cinch nut is tightened. Thereafter, the fiber can be removed simply by loosening the nut.

APPLICATIONS

- Household Appliances
- Motor Controller Triggering
- PC-to-Peripheral Links
- Medical Instruments
- Automotive Electronics
- Audio Systems
- Electronic Games
- Robotics Communications

FEATURES

- ◆ Excellent Linearity
- ◆ 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
- ◆ Simple PWB Mounting
- ◆ Rugged Screw Attachment

MAXIMUM RATINGS

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

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

Junction Temperature (T_J)85°C

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

Collector Emitter Voltage (V_{CEQ})....30 V

Emitter Collector Voltage (V_{ECQ})5 V

Collector Current (I_C).....50 mA

Collector Peak Current
(I_{CM}) $t = 1\text{ms}$ 100 mA

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

De-rate Above 25°C1.33 mW/°C

CHARACTERISTICS (T_A=25°C)

Parameter	Symbol	Value	Unit
Wavelength for Maximum Photosensitivity	λ_{PEAK}	870	nm
Spectral Bandwidth ($S=10\%$ of S_{MAX})	$\Delta\lambda$	400-1100	nm
Switching Times (10% to 90% and 90% to 10%) ($R_L=1\text{ k}\Omega$, $I_C=1.0\text{ mA}$, $V_{CE}=5\text{ V}$, $\lambda=950\text{ nm}$)	t_r, t_f	20	μs
Responsivity min. @ 880 nm @ 632 nm	R	100 50	$\mu\text{A}/\mu\text{W}$ $\mu\text{A}/\mu\text{W}$
Collector Dark Current ($V_{CE}=15\text{ volts}$)	I_{CEO}	< 100	nA
Breakdown Voltage ($I_C=100\text{ }\mu\text{A}$)	BV_{CEO}	≥ 30	V
Breakdown Voltage ($I_C=100\text{ }\mu\text{A}$)	BV_{ECO}	≥ 5	V
Saturation Voltage ($I_C=250\text{ }\mu\text{A}$, $H=100\text{ }\mu\text{W}$)	$V_{\text{CE sat}}$	0.15	V

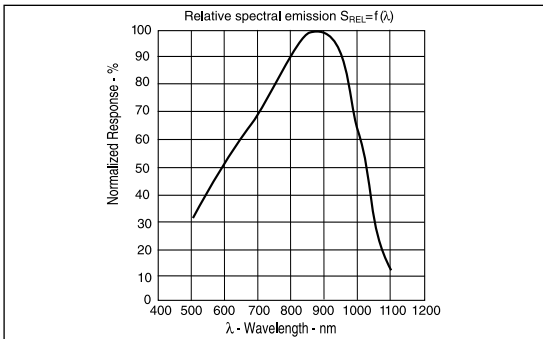


FIGURE 1. Typical detector response versus wavelength.

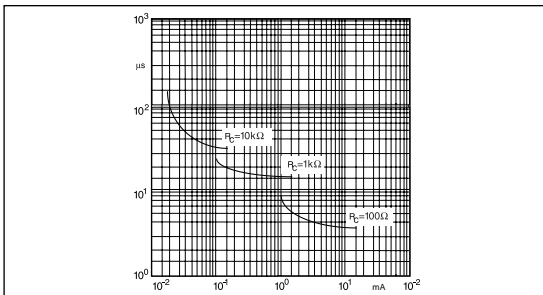


FIGURE 2. Rise and fall times of phototransistor.

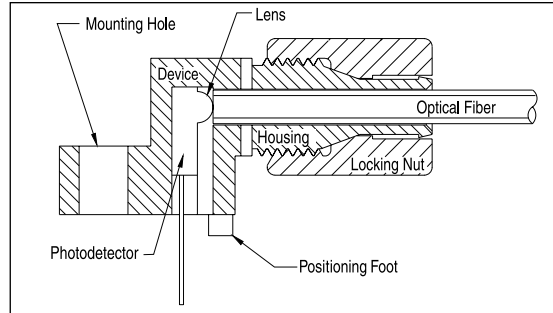
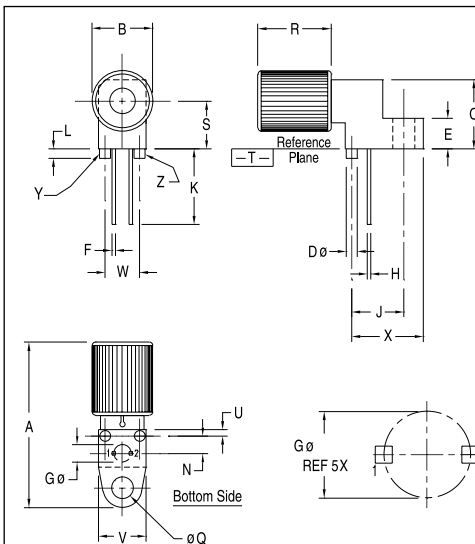


FIGURE 3. Cross-section of fiber optic device.

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 ϕ (2 PL):
 $\phi .25(0.010) \text{ } \textcircled{M} \text{ } | \text{ } T \text{ } | \text{ } Y \text{ } \textcircled{M} \text{ } | \text{ } Z \text{ } \textcircled{M}$
3. POSITIONAL TOLERANCE FOR F DIM (2 PL):
 $\phi .25(0.010) \text{ } \textcircled{M} \text{ } | \text{ } T \text{ } | \text{ } Y \text{ } \textcircled{M} \text{ } | \text{ } Z \text{ } \textcircled{M}$
4. POSITIONAL TOLERANCE FOR H DIM (2 PL):
 $\phi .25(0.010) \text{ } \textcircled{M} \text{ } | \text{ } T \text{ } | \text{ } Y \text{ } \textcircled{M} \text{ } | \text{ } Z \text{ } \textcircled{M}$
5. POSITIONAL TOLERANCE FOR Q ϕ :
 $\phi .25(0.010) \text{ } \textcircled{M} \text{ } | \text{ } T \text{ } | \text{ } Y \text{ } \textcircled{M} \text{ } | \text{ } Z \text{ } \textcircled{M}$
6. POSITIONAL TOLERANCE FOR B:
 $\phi .25(0.010) \text{ } \textcircled{M} \text{ } | \text{ } T \text{ } | \text{ } Y \text{ } \textcircled{M} \text{ } | \text{ } Z \text{ } \textcircled{M}$
7. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
8. CONTROLLING DIMENSION: INCH

PACKAGE IDENTIFICATION:

- ◆ Black housing w/ White dot
- PIN 1. Emitter
- PIN 2. Collector

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	2.54	BSC	.100	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	.330	.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.