

DESCRIPTION

The IF-D92 is a high-sensitivity phototransistor detector housed in a “connector-less” style plastic fiber optic package. Optical response of the IF-D92 extends from 400 to 1100 nm, making it compatible with a wide range of visible and near-infrared LEDs and laser diode sources. This includes 650 nm visible red LEDs used for optimum transmission in PMMA plastic optical fiber. 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-D92 is suitable for digital data links at rates up to 25 kbps. Analog bandwidths greater than 15 kHz are possible making the IF-D92 usable for high frequency audio transmission. Phototransistor operation provides high internal gain – reducing the amount of post-amplification required in many circuits. The integrated design of the IF-D92 makes it a simple, cost-effective solution in a variety of analog and digital applications.

APPLICATIONS

- ▶ Low-Speed Digital Data Links
- ▶ Motor Controller Triggering
- ▶ Audio Links
- ▶ Medical Instruments
- ▶ Automotive Electronics
- ▶ Robotics Communications
- ▶ EMC/EMI Signal Isolation
- ▶ Electronic Games
- ▶ Process Control

FEATURES

- ◆ High Optical Sensitivity
- ◆ 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

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) $t \leq 5$ s.....	240°C
Collector Emitter Voltage (V_{CEO}).....	30 V
Emitter Collector Voltage (V_{ECO})	5 V
Collector Current (I_C).....	50 mA
Collector Peak Current (I_{CM}) $t = 1$ ms	100 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
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%) ($R_L = 1$ k Ω , $I_C = 1.0$ mA, $V_{CE} = 5$ V, $\lambda = 950$ nm)	t_r, t_f	-	20	-	μs
Responsivity min. @ 880 nm	R	-	100	-	$\mu\text{A}/\mu\text{W}$
@ 632 nm		-	50	-	$\mu\text{A}/\mu\text{W}$
Collector Dark Current ($V_{CE} = 15$ volts)	I_{CEO}	-	-	100	nA
Breakdown Voltage ($I_C = 100$ μA)	BV_{CEO}	30	-	-	V
Breakdown Voltage ($I_C = 100$ μA)	BV_{ECO}	5	-	-	V
Saturation Voltage ($I_C = 250$ μA , $H = 100$ μW)	$V_{CE sat}$	-	0.15	-	V

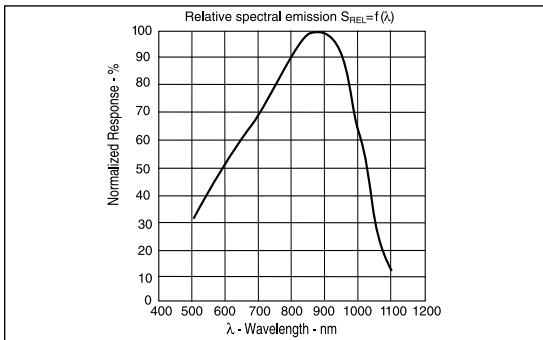


FIGURE 1. Typical detector response versus wavelength.

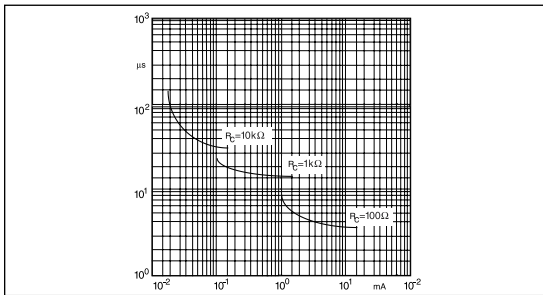


FIGURE 2. Rise and fall times of phototransistor.

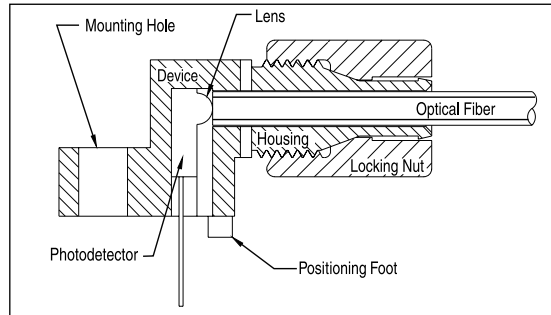
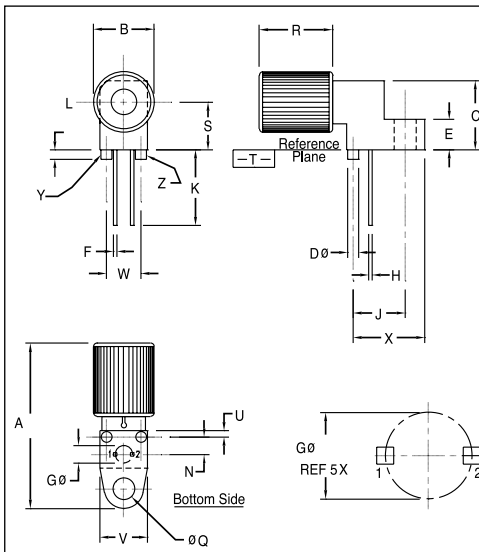


FIGURE 3. Cross-section of fiber optic device.

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):
 $\Phi \left[\begin{array}{c} \phi 0.25 (0.010) \text{ (M)} \\ \text{T} \end{array} \right] \text{ Y (M) } \left[\begin{array}{c} \text{Z} \\ \text{(M)} \end{array} \right]$
3. POSITIONAL TOLERANCE FOR F DIM (2 PL):
 $\Phi \left[\begin{array}{c} 0.25 (0.010) \text{ (M)} \\ \text{T} \end{array} \right] \text{ Y (M) } \left[\begin{array}{c} \text{Z} \\ \text{(M)} \end{array} \right]$
4. POSITIONAL TOLERANCE FOR H DIM (2 PL):
 $\Phi \left[\begin{array}{c} 0.25 (0.010) \text{ (M)} \\ \text{T} \end{array} \right] \text{ Y (M) } \left[\begin{array}{c} \text{Z} \\ \text{(M)} \end{array} \right]$
5. POSITIONAL TOLERANCE FOR Q ϕ :
 $\Phi \left[\begin{array}{c} \phi 0.25 (0.010) \text{ (M)} \\ \text{T} \end{array} \right] \text{ Y (M) } \left[\begin{array}{c} \text{Z} \\ \text{(M)} \end{array} \right]$
6. POSITIONAL TOLERANCE FOR B:
 $\Phi \left[\begin{array}{c} \phi 0.25 (0.010) \text{ (M)} \\ \text{T} \end{array} \right]$
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	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.