

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

DESCRIPTION

The IF-D92 is a high-sensitivity NPN 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 optic fiber. The detector package features an internal micro-lens and a precision-molded PBT housing to ensure efficient optical coupling with standard 1000 μ m 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.

FEATURES

- ◆ High Optical Sensitivity
- ◆ Mates with Standard 1000 μ 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
- ◆ RoHS Compliant

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}) $t = 1$ ms100 mA
Power Dissipation
(P_{TOT}) $T_A = 25^\circ\text{C}$ 100 mW
De-rate Above 25°C 1.33 mW/ $^\circ\text{C}$

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%) ($R_L=1\text{ k}\Omega$, $I_C=1.0\text{ mA}$, $V_{CE}=5\text{ V}$, $\lambda=950\text{ nm}$)	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 ($I_C=100\mu\text{A}$)	BV_{CEO}	30	–	–	V
Breakdown Voltage ($I_C= -100\mu\text{A}$)	BV_{ECO}	5	–	–	V
Saturation Voltage ($I_C=250\mu\text{A}$, $H=100\mu\text{W}$)	$V_{CE\text{ sat}}$	–	0.15	–	V

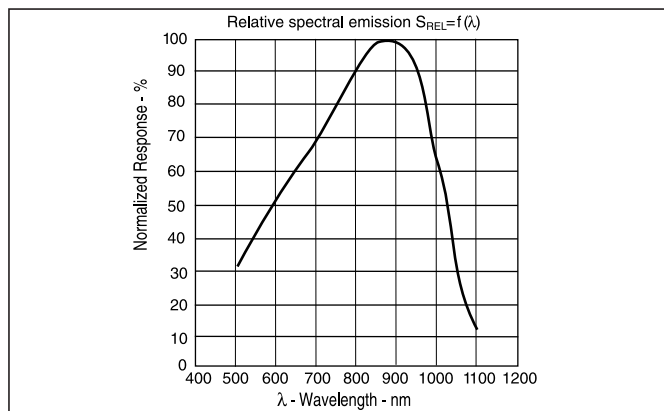


FIGURE 1. Typical detector response versus wavelength.

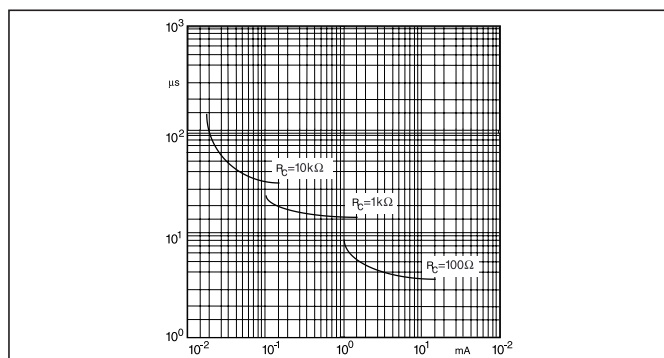


FIGURE 2. Rise and fall times of phototransistor.

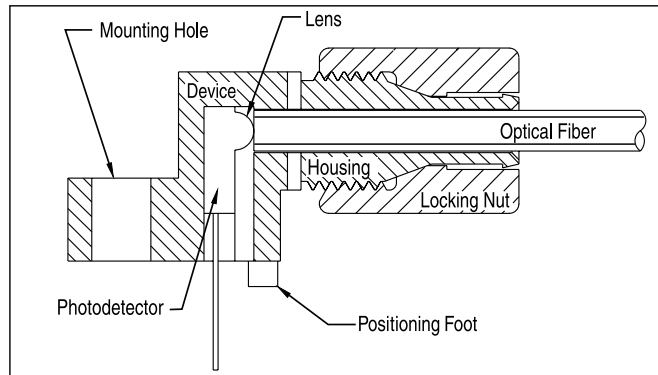
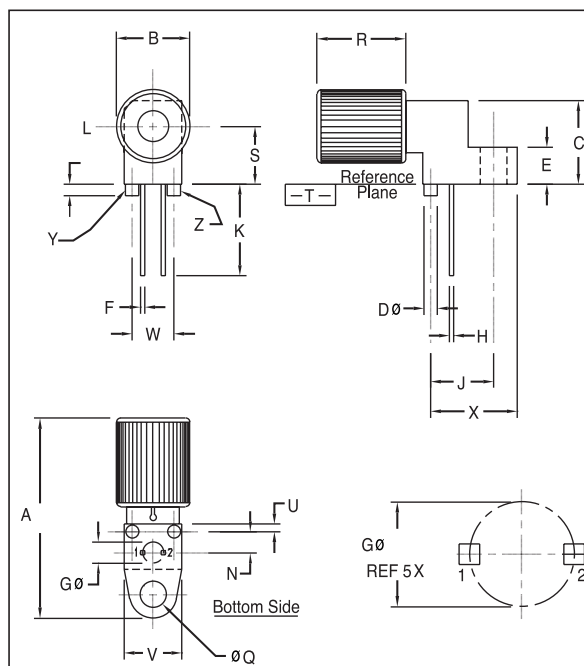


FIGURE 3. Cross-section of fiber optic device.

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 \emptyset (2 PL):
 $\oplus \emptyset 0.25 (0.010) \text{ M } T \text{ Y } \text{ M } Z \text{ M}$
3. POSITIONAL TOLERANCE FOR F DIM (2 PL):
 $\oplus 0.25 (0.010) \text{ M } T \text{ Y } \text{ M } Z \text{ M}$
4. POSITIONAL TOLERANCE FOR H DIM (2 PL):
 $\oplus 0.25 (0.010) \text{ M } T \text{ Y } \text{ M } Z \text{ M}$
5. POSITIONAL TOLERANCE FOR Q \emptyset :
 $\oplus \emptyset 0.25 (0.010) \text{ M } T \text{ Y } \text{ M } Z \text{ M}$
6. POSITIONAL TOLERANCE FOR B:
 $\oplus \emptyset 0.25 (0.010) \text{ M } T$
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

	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	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.