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Part No. 08MFOD72

Plastic Fiber Optic Phototransistor IF-D92

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 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 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.

Features

- High Optical Sensitivity
- Mates with Standard 1000 um 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°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_{CEO})....30 V

Emitter Collector Voltage (V_{ECO}) .....5 V

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

Collector Peak Current (I_{CM}) t = 1ms .....100 mA

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

De-rate Above 25°C .....1.33 mW/°C

Characteristics (T_A=25°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 kΩ, I_C=1.0 mA, V_{CE}=5 V, λ=950 nm)	t_r, t_f	–	20	–	µs
Responsivity min. @ 880 nm @ 632 nm	R	– –	100 50	– –	µA/µW µA/µW
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

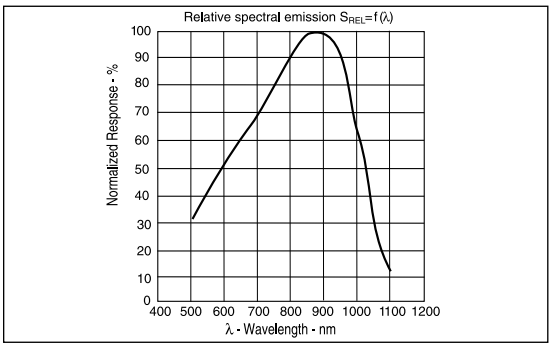


FIGURE 1. Typical detector response versus wavelength.

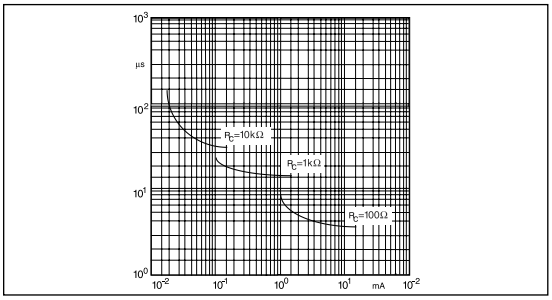


FIGURE 2. Rise and fall times of phototransistor.

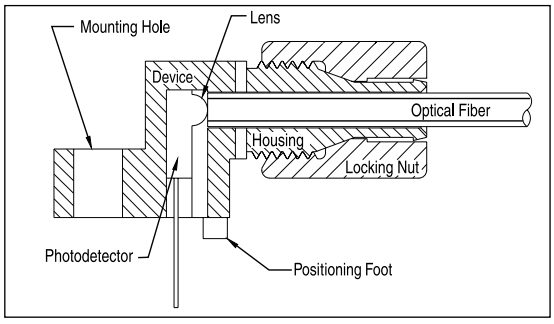
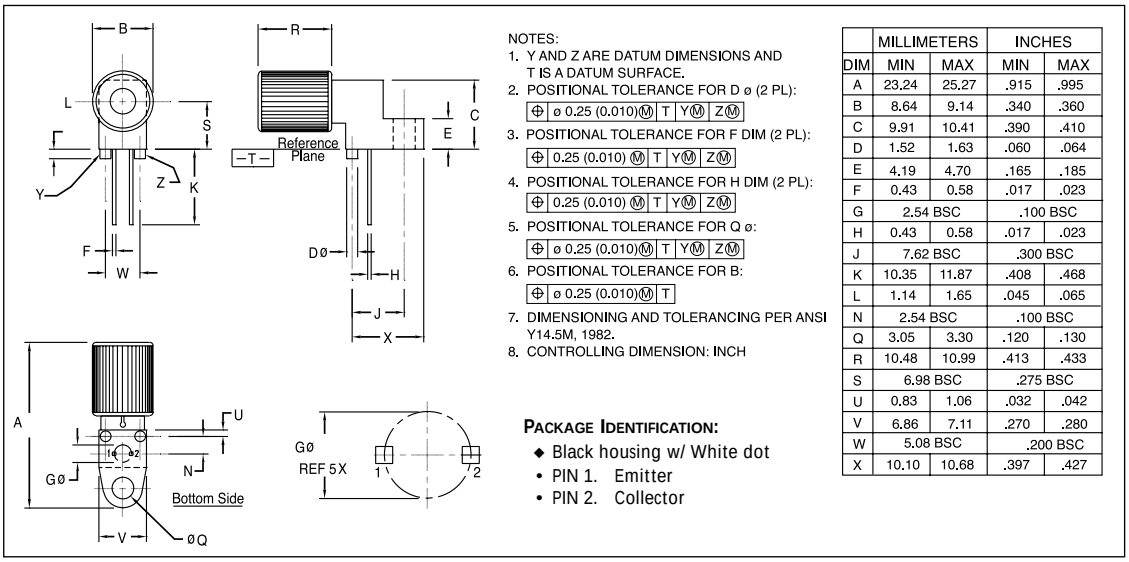


FIGURE 3. Cross-section of fiber optic device.

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 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:
- ◆ 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.