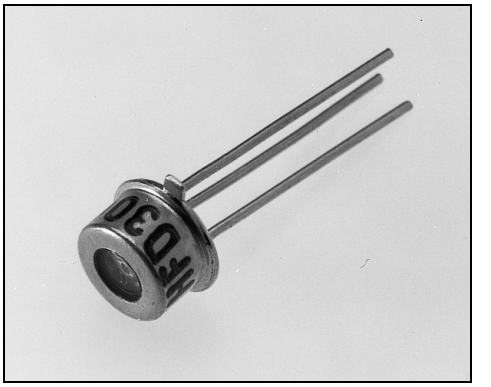
HFD3002

Silicon PIN Photodiode

FEATURES

- Electrically isolated from TO-46 case
- Low capacitance
- High speed: t_r = 30 ns max. at V_R = 5 V; 10 ns max. at V_R = 15 V
- High responsivity



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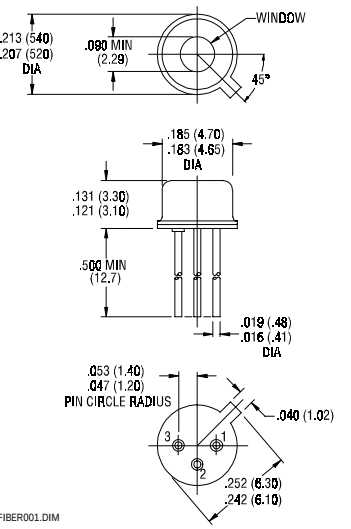
DESCRIPTION

The HFD3002 PIN photodiode is designed for high speed use in fiber optic receivers. It has a large area detector, providing efficient response to 50-1000 µm diameter fibers at wavelengths of 650 to 950 nanometers. It is designed to be used with fiber optic receptacles which align its optical axis with the axis of the optical fiber by referencing the precision outside diameter of the window can.

The HFD3002s metal case is electrically isolated from anode and cathode terminals to enhance the EMI/RFI shielding, increasing sensitivity and speed. It is also available in special active device receptacles, electrically isolated from their receptacles to improve sensitivity. The receptacle acts as a shield to improve the sensitivity/dark current specifications of the connectorized device.

OUTLINE DIMENSIONS in inches (mm)



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Pinout

1. Anode
2. Cathode
3. Case (ground)

Notes

1 Anode and cathode isolated from case.

2 Chip has 0.03 in. (0.76 mm) diameter active area.

3 Chip active area is located 0.024 in. (0.60 mm) below detector front surface.

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ELECTRO-OPTICAL CHARACTERISTICS (T_C = 25°C unless otherwise stated)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Peak Response Wavelength	λ_P		850		nm	
Flux Responsivity, λ = 850 nm (1)	R				A/W	
			0.60			50 µm, 0.20 NA fiber
		0.45	0.60			100 µm, 0.28 NA fiber
			0.55			200 µm, 0.40 NA fiber
			0.30			1000 µm. 0.53 NA fiber
Dark Leakage Current	I_D		0.05	2.0	nA	V_R = 5 V
Reverse Breakdown Voltage	B_{VR}	110	250		V	I_R = 10 mA
Response Time	t_R				ns	
10-90%			17.0	30.0		V_R = 5 V
			5.0	10.0		V_R = 15 V
			1.0			V_R = 90 V
Package Capacitance	C		1.4		pF	V_R = 5 V, f = 1 MHz
Field of View	FoV		85		Degrees	

Notes

1. Responsivity is measured with a fiber optic cable centered on the mechanical axis, using an 850 nm HFE4050 LED optical source to the fiber. Fiber length is nominally 3 meters.

ABSOLUTE MAXIMUM RATINGS

(25°C Free-Air Temperature unless otherwise noted)

Storage temperature	-65 to +150°C
Operating temperature	-55 to +125°C
Lead solder temperature	240°C, 3 min. 260°C, 10 s
Case/cathode (anode) voltage	110 V
Power dissipation	200 mW
Reverse voltage	110 V

Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods of time may affect reliability.

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ORDER GUIDE

Description	Catalog Listing
Standard silicon PIN photodiode, metal TO-46 case	HFD3002-002

This package is also available in special interface receptacles for interfacing to standard fiber optic cables.

CAUTION

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation to equipment, take normal ESD precautions when handling this product.

FIBER INTERFACE

Honeywell detectors are designed to interface with multimode fibers with sizes (core/cladding diameters) ranging from 50/125 to 200/230 microns. Honeywell performs final tests using 100/140 micron core fiber. The fiber chosen by the end user will depend upon a number of application issues (distance, link budget, cable attenuation, splice attenuation, and safety margin). The 50/125 and 62.5/125 micron fibers have the advantages of high bandwidth and low cost, making them ideal for higher bandwidth installations. The use of 100/140 and 200/230 micron core fibers results in greater power being coupled by the transmitter, making it easier to splice or connect in bulkhead areas. Optical cables can be purchased from a number of sources.

Fig. 1 Rise/Fall Time vs Reverse Bias Voltage

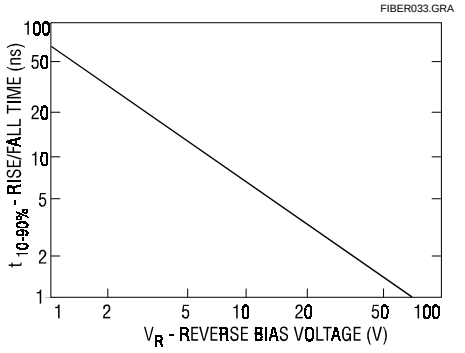

Fig. 2 Package Capacitance vs Reverse Bias Voltage

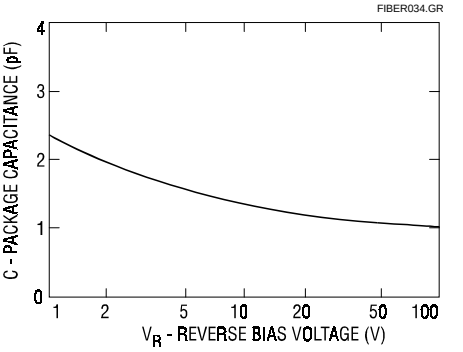

Fig. 3 Spectral Responsivity

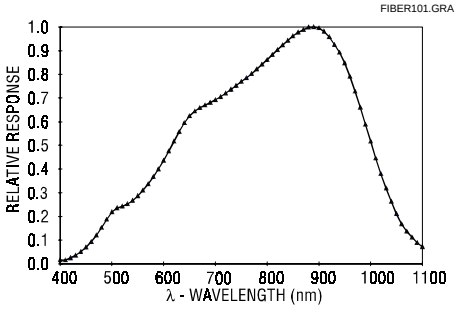

Fig. 4 Dark Leakage Current vs Temperature

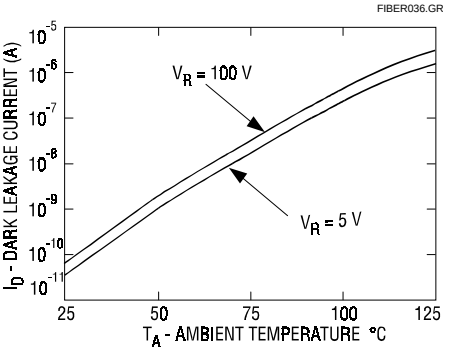

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Fig. 5 Angular Response