HFD3026

Analog Output Receiver

FEATURES

- 35 MHz analog output receiver
- 14 ns typical Rise/Fall times
- Optical input signal from 0.5 to 100 µW
- Single 5V power supply operation
- Plastic cap with TO-18 header
- Operates with Honeywell 850 nm LEDs and integrated transmitters

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DESCRIPTION

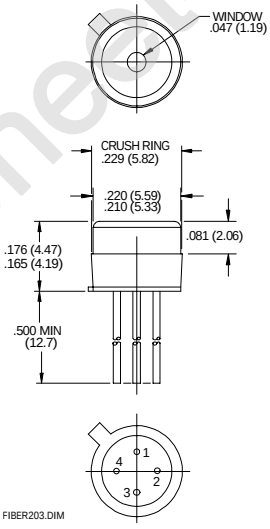
The HFD3026 is a 35 MHz fiber optic analog receiver with an on-chip voltage regulator to assure improved noise immunity. The linear output voltage swing is inverted from the optical input, and proportional to the optical input power levels between 0.5 µW and 100 µW. It has an equivalent circular active diameter of 0.020 inch. The HFD3026 is supplied in a Honeywell plastic package, and can be mounted in several types of fiber optic connectors. Companion optical LEDs are available.

OPERATION

The HFD3026 fiber optic analog receiver has on-chip voltage regulation which requires an external 0.1 µF bypass capacitor. This capacitor should be connected between pin # 1 (bypass capacitor) and pin 4 (ground). Noise immunity is enhanced by keeping lead lengths as short as possible. The output has a linear voltage swing proportional to the optical power striking the photodiode between input luminance of 0.5 µW and 100 µW . Guaranteed minimum response is 4 mV/µW, which provides 2.0 mV output for 0.5 µW input.

For standard electrical loads, a post-amplifier should be used with the HFD3026. When a load capacitance of 3 pF or more is encountered, a 330 Ω resistance in series with the output is required to minimize ringing of the output signal. This provides an excellent electrical signal for the system designer. The HFD3026-012 has a 500 Ω output drive capability for higher load applications.

OUTLINE DIMENSIONS in inches (mm)



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Pinout

1. Bypass capacitor
2. V_{CC}
3. Data output
4. Case (ground)

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ELECTRO-OPTICAL CHARACTERISTICS (T_C = 25°C, V_{CC} ±10% unless otherwise stated)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Responsivity	R				mV/µW	f = 10 MHz, P_{IN} = 10 µW peak,
T = 25°C		4	5	10		850 nm 100/140, (NA = 0.29)
-40 < T < +100°C		3	5	12		micron fiber
Input Power	P_{IN}					f = 10 MHz, PWD ≤ 10%
		0.5		100	µW	
		-33		-10	dBm	
DC Output Voltage	V_{ODC}				V	P_{IN} ≤ 0.1 µW peak
HFD3026-002			1.4			
HFD3026-012			0.7			
Power Supply Current	I_{CC}				mA	V_{CC} = 5 V ± 10%
HFD3026-002		5	6.6	10		
HFD3026-012			9.7	14		
Rise/Fall Time	t_R/t_F				ns	f = 10 MHz, P_{IN} = 10 µW peak,
HFD3026-002			14	18		@ 850 nm (t_R = 10-90%, t_F =
HFD3026-012			7	10		90-10%)
Pulse Width Distortion					ns	f = 10 MHz, P_{IN} = 60 µW peak
						@ 850 nm
	t_{PLH}			2		
	t_{PHL}			2		
Bandwidth	BW				MHz	P_{IN} = 10 µW peak @ 850 nm,
						R = 0.707 R max.
HFD3026-002			35			
HFD3026-012			50			
RMS Noise Output Voltage	V_{NO}				mV	P_{IN} = 0 µW (1)
T = 25°C			0.16	0.35		
-40 < T < +100°C				0.43		
Output Impedance	I_O		20		Ω	

Notes

1. Tested using a 30 MHz bandwidth filter.

ABSOLUTE MAXIMUM RATINGS

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

Storage temperature	-40 to +100°C
Operating temperature	-40 to +100°C
Lead solder temperature	260°C, 10 s
Supply voltage	-0.5 to +7 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.

RECOMMENDED OPERATING CONDITIONS

Operating temperature	-40 to +85°C
Supply voltage	4.5 to 5.5 V
Optical signal input	0.5 to 100 µW
Optical signal pulse width	> 25 ns

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ORDER GUIDE

Description	Catalog Listing
Standard, TO-18 plastic package analog output receiver	HFD3026-002
500 Ω output, TO-18 plastic package analog output receiver	HFD3026-012

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

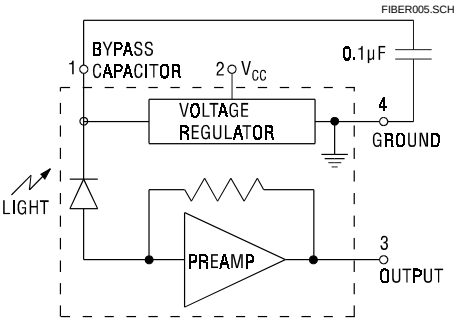
CAUTION

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.

BLOCK DIAGRAM



SWITCHING WAVEFORM

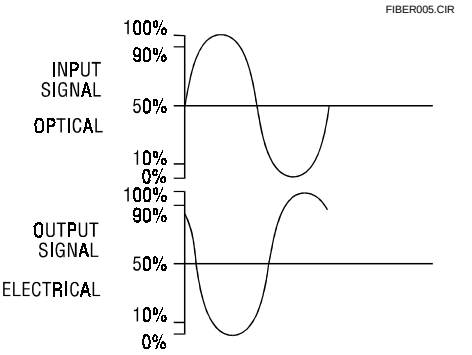


Fig. 1 Responsivity vs Frequency

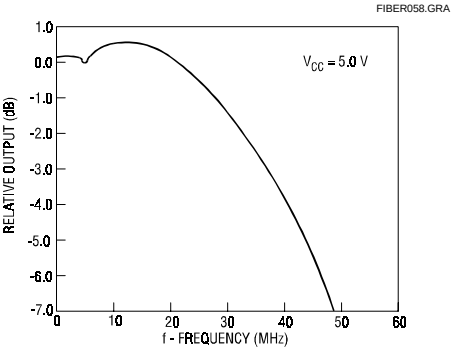


Fig. 2 Spectral Responsivity

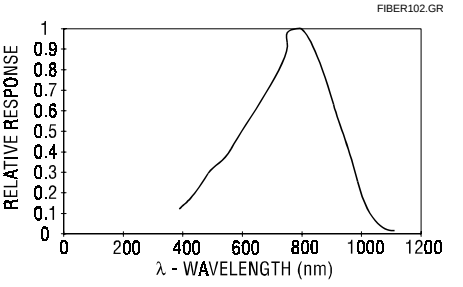


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Fig. 3 Output Power Supply Rejection Ratio vs Frequency

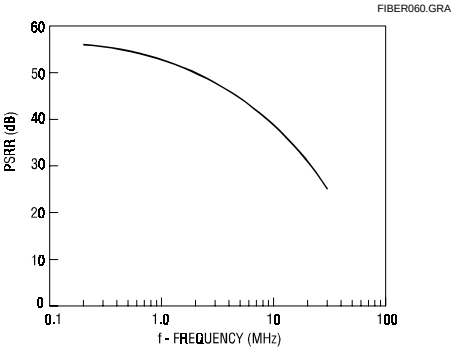

Fig. 4 RMS Output Noise vs Frequency