Fiber Optic LAN Components
Connectorized PIN Plus Preamplifier *HFD3381-102*

FEATURES

- Prealigned SC Connector sleeve
- Data rates from 622 Mbps to 2.5 Gbps
- PIN detector and preamplifier in a TO-46 heremtic package
- 3.3V operation
- GaAs PIN detector and BiCMOS preamplifier
- Differential Output for low noise
- 2.4 GHz typical Bandwidth



The HFD3381-102 is a high-performance 850nm GaAs detector and pre-amplifier packaged for high-speed data communications. The product is designed for ease of use by the module designer or manufacturer for data rates from 622 Mbps to 2.5 Gbps.

The HFD3381-102 converts optical power into an electrical signal that is used in fiber optic communications and other applications. As the light increases, the output voltage increases, limiting at input powers above –10dBm. The differential output is designed to be **AC** coupled into a data amplifier. The pre-aligned and lensed package with an industry standard SC style connector sleeve, allows for "drop in" assembly to reduce manufacturing cost.

The Honeywell HFD3381-102 is designed to interface with 50/125 and 62.5/125mm multimode fiber.

ABSOLUTE MAXIMUM RATINGS

Parameter	Rating
Storage Temperature	-40 to +85°C
Case Operating Temperature	0 to +70°C
Lead Solder Temperature	260°C, 10 sec.
Power Supply Voltage	-0.5 to +3.8 V
Incident Optical Power	0 dBm average, +4 dBm peak

NOTICE

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 operations section for extended periods of time may affect reliability.

ELECTRO-OPTICAL CHARACTERISTICS (Vcc=3.3V, **AC coupled to 50Ω**, 0°C<T<70°C unless otherwise specified)

Parameters	Test Condition	Symbol	Min.	Typ.	Max.	Units	Notes
Electrical Characteristics							
Supply Voltage	P_{in} = 0µW, Rload=50Ω	V_{cc}	3.0	3.3	3.6	Volts	1
Supply Current	P_{in} = 0µW, Rload=50Ω	I_{cc}		26	40	mA	1
Output Offset Voltage	P_{in} = 0µW, Rload=50Ω	Voffset	-100		100	mV	9,10
Output Resistance	Single ended, freq = 0Hz	R_o	40	50	62	Ω	
Opto-Electronic Characteristics							
Responsivity	P_{in} < AGC_{th}, Rload=50Ω	R		1400		µV/µW	2,3,10
Differential Output Voltage	P_{in} = 200µW, Rload=50Ω, Voffset = 0 mV	V_{out}	90	160	400	mV	1
Upper 3dB Bandwidth		BW_{upper}	1700	1900	2500	MHz	4
RMS Output Referred Noise	P_{in}=0µW, R_{load}=50Ω 1875 MHz BT Filter			1.5	2.25	mV	5
Sensitivity	BER=10^{-12}, SNR=7	S	-17	-20		dBm	
Power Supply Rejection Ratio	P_{in}=0µW, R_{load}=50Ω	PSRR	10	30		dB	6
Pulse Width Distortion	P_{in}=20µW peak, R_{load}=50Ω	PWD			40	ps	7
Rise/Fall Time	P_{in}=20µW peak, R_{load}=50Ω	T_R/T_F			250	ps	8
Wavelength Responsivity	P_{in}=20µW peak, R_{load}=50Ω	λ	760	850	860	nm	
AGC_{th} threshold power	Voffset = 0mV, Pin = Peak power	AGC_{th}		60		µW	9,10

Notes:

1. Pin refers to the peak optical power at the face of the fiber optic cable input to the HFD3381-102.
2. Responsivity measured with source wavelength of 850nm, freq = 0Hz, P_{in}< AGC_{th}, R_{load}=50Ω, sample tested at 2.5Gbps
3. The output voltage increases as received light power increases, up to approximately –15dBm depending upon the AGC_{th}. The preamplifier is designed to limit the electrical output signal above this optical input level, and does not introduce signal distortion until the average input power exceeds 0dBm.
4. Bandwidth is measured with a small signal sinusoidal light source with 50 µW average power, R_{load}=50Ω.
5. RMS input referred optical noise is sample tested by measuring the RMS output referred noise, then dividing by the responsivity.
6. PSRR is sample tested from 300KHz to 1GHz by injecting a –20dB electrical signal on the V_{cc} pin. The nominal value at 100MHz is recorded. No external bypass components are assumed. An external V_{cc} filter network will greatly increase the PSRR.
7. Sample tested at the 50% level of output pulses.
8. Rise and fall times are sample tested with source wavelength of 850nm, 125MHz square wave, with optical rise and fall times < 200ps, P_{in}< AGC_{th}, R_{load}=50Ω. Measured at 20% - 80% signal levels
9. Output offset voltage is defined as Vout – VoutQ with no light
10. The AGC_{th} power depends on the offset voltage. Refer to fig 3.

NOTICE

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

FIGURE 1: INTERNAL SCHEMATIC DIAGRAM OF THE HFD3381-102

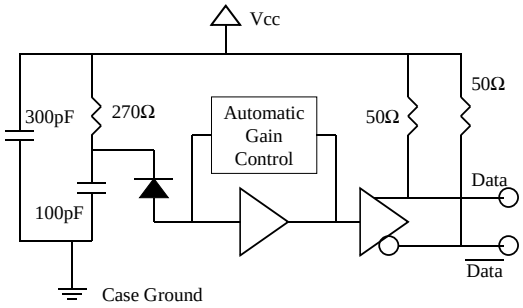
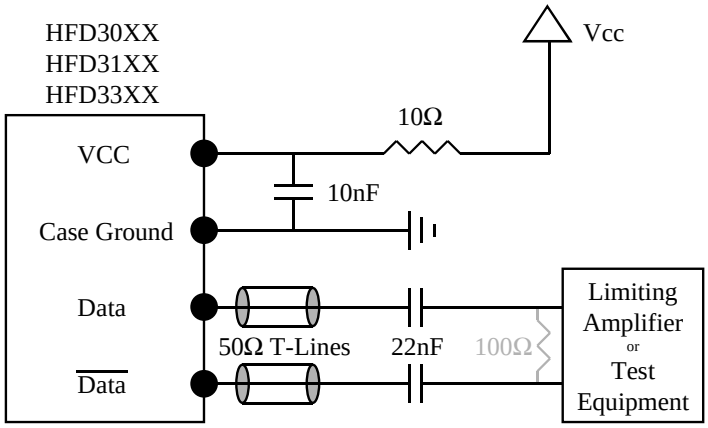


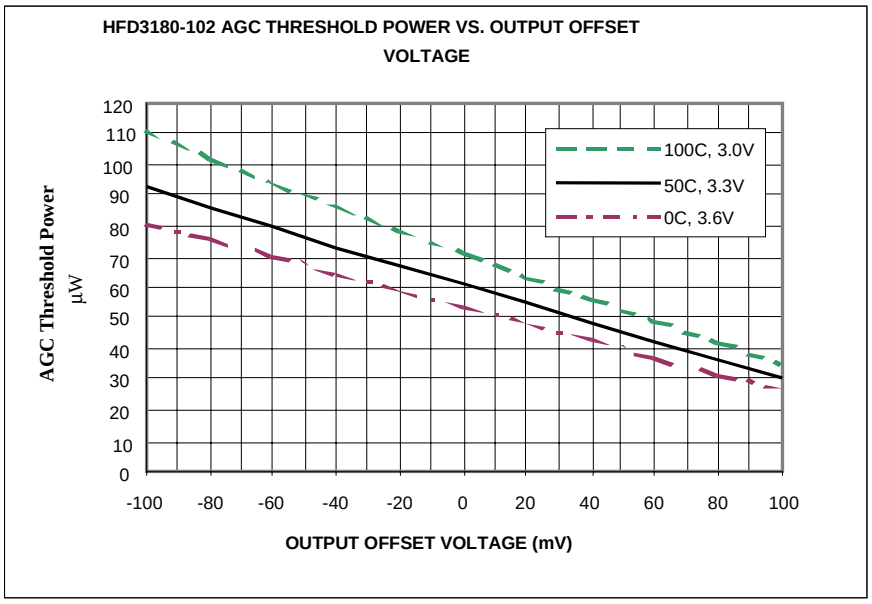
FIGURE 2: RECOMMENDED INTERFACE CIRCUIT FOR THE HFD3381-102



Note: 100Ω terminating resistor is optional

R=10 Ω
C_1 = 10 nF
C_2 = Data rate dependant (22nF for rates > 1Gbps

FIGURE 3: AGC THRESHOLD POWER VS. OUTPUT OFFSET VOLTAGE

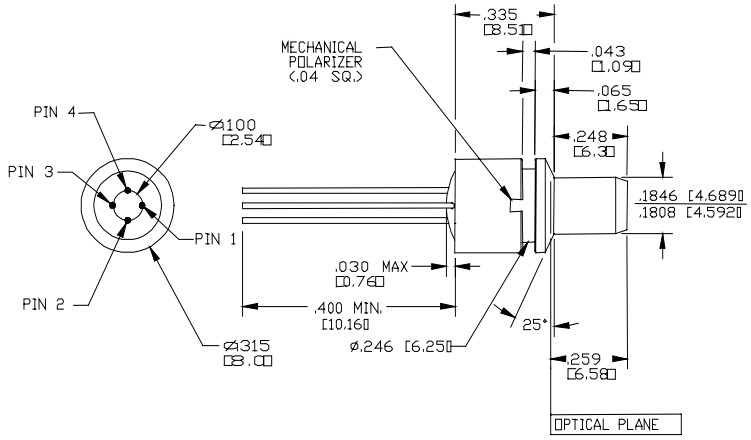


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ORDER GUIDE

Catalog Listing	Description
HFD3381-102	Connectorized PIN Plus Preamplifier

MOUNTING DIMENSIONS (for reference only) in./(mm)



PINOUT

Number	Function
1 *	V_{CC}
2	Inverted Output
3	Ground
4	Non Inverted Output

* Aligned with the Receptacle notch
* VCC is cut shorter

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Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Commencing with the date of shipment, Honeywell's warranty runs for 18 months. If warranted goods are returned to Honeywell during that period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is **in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose**.

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