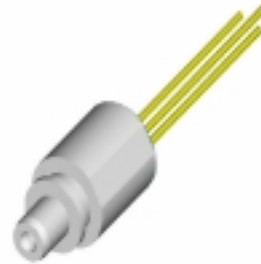


Fiber Optic LAN Components PIN Plus Preamplifier

Preliminary
HFD3141-103

FEATURES

- Pre-aligned LC SFF Connector sleeve
- PIN detector and preamplifier in a TO-46 hermetic package
- Data rates from DC to 2.5 Gbps
- InGaAs PIN detector and BiCMOS preamplifier
- Operation at 3.3V
- Differential output for low noise
- 2.3GHz typical Bandwidth



The HFD3141-103 is a high-performance 1300nm integrated InGaAs detector (40micron active area) and pre-amplifier in a pre-aligned LC SFF connector for single mode applications. The product is designed for ease of use in modules designed for 2.5GB/s data rate.

The HFD3141-103 converts optical power into a differential output electrical signal that is used in fiber optic communications and other applications. As the light increases, the differential output voltage increases. Above peak optical powers of approximately -11.5dBm , AGC circuitry in the TIA limits the optical voltage swings. The differential output is designed to be AC coupled to a 50 ohm load impedance pulled down to ground prior to any post amplification stages.

To achieve the full-specified operational bandwidth, it is recommended that the products component leads be attached to within 0.10" of the receptacle with a controlled impedance path.

The Honeywell HFD3141-103 is designed to interface with single mode fiber.

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ABSOLUTE MAXIMUM RATINGS

Parameter	Rating
Storage Temperature	-40 to +85°C
Case Operating Temperature	-40 to +85°C
Lead Solder Temperature	260°C, 10 sec.
Power Supply Voltage	-0.5V to 3.8V
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 (V_{CC}=3.3V, AC coupled to 50Ω, 0°C<T<70°C unless otherwise specified)

Parameters	Test Condition	Symbol	Min.	Typ.	Max.	Units	Notes
Active Area				40		μm	
Input Optical Wavelength	0°C to 70°C	λ _p	1200	1310	1600	nm	1
Responsivity	P _R < AGC _{th} , -40°C to +85 °C PD active area is 40um dia.	R	1.1	2.3	3.8	mV/μW	1,2
Differential Output Voltage Swing	P _R = -7dBm , AC Coupled to R _L =50Ω	V _{o(pk-pk)}	0.10	0.20		V	
Supply Current	P _R =0μW peak, R _L =50Ω	ICC		25	40	mA	1
-3dB Optical/Electrical Bandwidth	P _R =-12dBm Temp = 25°C	BW	1.6	2.0	2.5	GHz	1,3
Low Frequency –3dB Cutoff	P _R =-12dBm	BW _{LF}			0	KHz	1,3
RMS Input Referred Noise Equivalent Power	1875 MHz, 4-pole BT Filter, P _R =0uW (Dark)	NEP		0.50	0.65	μW	4
Power Supply Rejection Ratio	P _R =0μW (Dark), Freq = 100MHz	PSRR		30		dB	1,7
Sensitivity	BER = 10 ⁻¹² , SM Fiber		-22.5			dB	10
Pulse Width Distortion	P _R =-12dBm	PWD			60	ps	1,5
Rise/Fall Time	P _R =-12dBm, (20%-80%)	T _R /T _F	105	130	170	ps	1,6
AGC Threshold Power	Peak Optical Power Input	AGC _{th}		75		μW	8

Notes:

- P_R is the average optical power incident on the receptacle.
- Responsivity measured with source wavelength of 1310nm, with light source modulated at 250MHz. Peak received optical power <AGC_{th}
- Bandwidth is measured with a small signal sinusoidal light source with –12dBm average power.
- RMS input referred optical noise equivalent power is obtained by measuring the RMS output noise into an 1875 MHz, 4-pole Bessel-Thompson filter then dividing by the DC responsivity.
- Measured at the 50% level of output pulses
- Rise/Fall times are corrected for optical source Rise/Fall times. The corrected value is calculated as the square root of the difference of the squares of the measured differential detector output and the source.
- Value shown is with no external power supply filtering. Improved performance can be obtained by using external filtering close to the power supply leads.
- The AGC threshold power is the peak received optical power. At lower power, the receiver operates in its linear responsivity characteristic region. Above AGC threshold, the output voltage is relatively independent of the optical input power.
- Typical values represent measured data at 25°C.
- Sensitivity is reduced by about 1dB for MM fiber.

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

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FIGURE 1: INTERNAL SCHEMATIC DIAGRAM OF THE HFD3141-103

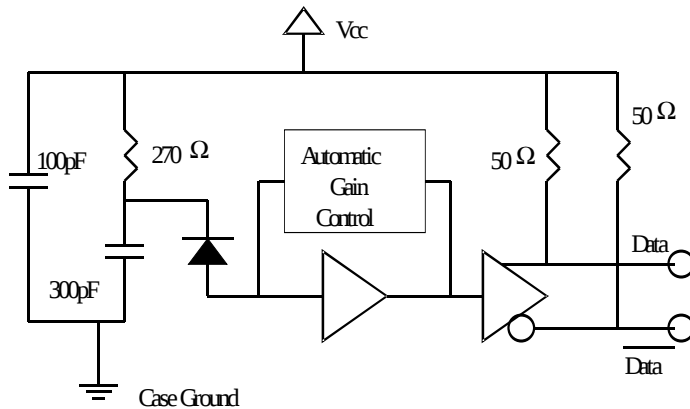
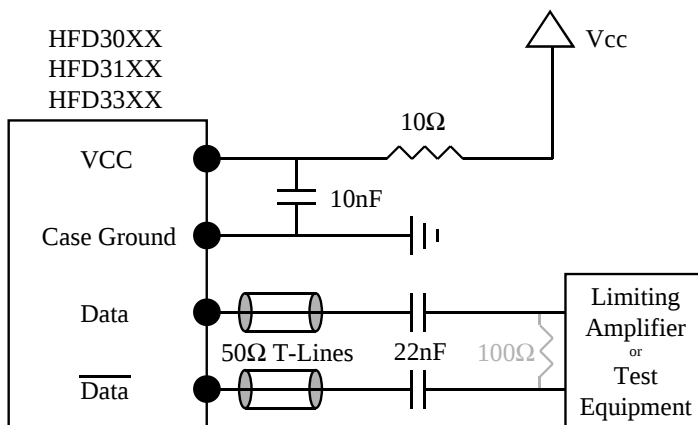


FIGURE 2: RECOMMENDED INTERFACE CIRCUIT FOR THE HFD3141-103



Note: 100 Ω terminating resistor is optional

$R=10\ \Omega$

$C_1 = 10\ \text{nF}$

$C_2 = \text{Data rate dependant (22nF for rates} > 1\text{Gbps)}$

Fiber Optic LAN Components

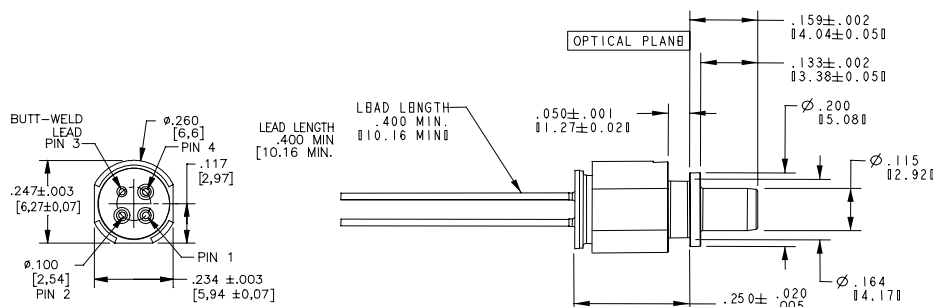
PIN Plus Preamplifier

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HFD3141-103

ORDER GUIDE

Catalog Listing	Description
HFD3141-103	PIN Plus Preamplifier, LC connectorized

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



PINOUT

Number	Function
1	V _{CC}
2	Inverted Output
3	Ground
4	Non-Inverted Output

WARRANTY/REMEDY

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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