Finisar

Product Specification

SW Detector 2Gbps, PIN+Pre-amp, TO-46

HFD3081-108

PRODUCT FEATURES

- Low electrical parasitic TO-46 package
- High performance GaAs PIN photodiode with separate transimpedance amplifier
- Low electrical parasitic TO46 package
- Data rates from 155Mbps to 2.5Gbps
- Low bias currents and voltages

The HFD3081-108 use a high-performance GaAs PIN photo-detector packaged with a transimpedance amplifier designed to meet performance requirements for data rates up to 2.5Gbps data communication over multi-mode optical fiber at 850nm. Applications include Ethernet, Fiber Channel and ATM protocols

PRODUCT SELECTION

Part Number	Description
HFD3081-108	Detector, 4 pin TO-46, rated for 1G and 2G applications

I. 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 4V
Incident Optical Power	+3 dBm average, +6 dBm peak
ESD Exposure (Human Body Model)	225V[1]

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.

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

II. Electro-Optical Characteristics

3.0V<Vcc<3.6V, AC coupled to 50Ω (100Ω differential), -40°C<T<85°C unless otherwise specified

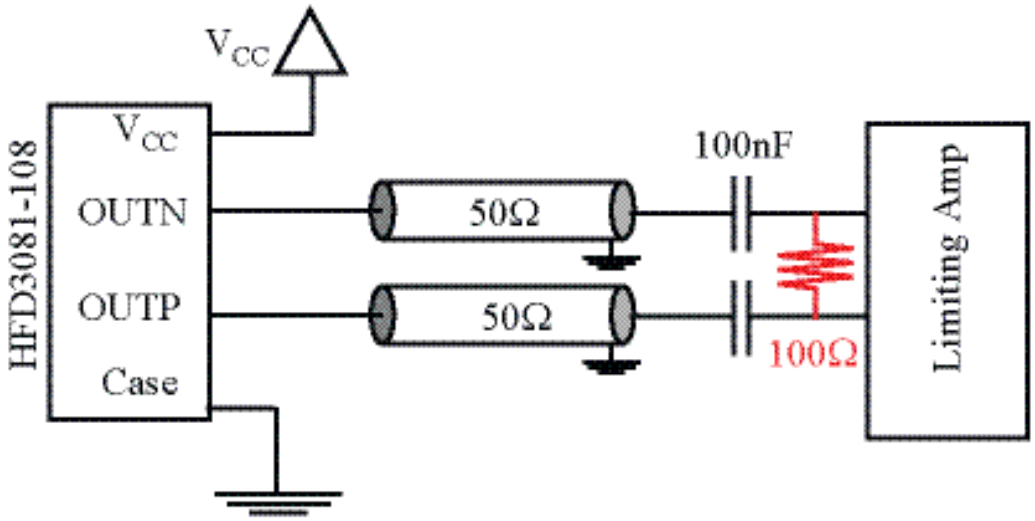
Parameters	Test Condition	Symbol	Min.	Typ.	Max.	Units	Notes
Data Rate		DR	0.15		2.5	Gbps	
Supply Voltage			3.0	3.3	3.6	V	
Supply Current	PR =0μW, RL=50ΩAC coupled	ICC		25	35	mA	1
Input Optical Wavelength	0°C to 70°C	λ_P	770	850	870	nm	
Maximum Average Input Power before Overload		P_{MAX}	0	+3		dBm	
Differential Output Voltage Swing	$P_{R,OMA}$= -12Bm, AC Coupled to R_L=50Ω	$V_{o(pk-pk)}$	100	150	220	mV	1,2
Differential Responsivity	$P_{R,OMA}$ = -12dBm, AC Coupled to R_L=50Ω	T	1500	2700	3500	V/W	1,2
-3dB Optical/Electrical Bandwidth	$P_{R,OMA}$ =-12dBm	BW	1.4	2		GHz	1,2,3
Low Frequency –3dB Cutoff	$P_{R,OMA}$ =-12dBm	BW_{LF}			10	KHz	1,2,3
Output Impedance		Z_{OUT}	42	50	58	Ω	
Output Return Loss	F<2GHz	S_{22}	8	12		dB	
RMS Input Referred Noise Equivalent Power	1.875GHz, 4-pole BT Filter, P_R=0uW (Dark), BER 10^-12	NEP			20	μW, OMA	4
Sensitivity, OMA	DR <= 2.5Gbps	S		-20.5	-18.5	dBm	5
Stressed Sensitivity, OMA	DR <= 2.5Gbps	$S_{Stressed}$		-17.5	-14.5	dBm	5,6
Rise/Fall Time	$P_{R,OMA}$ =-12dBm, (20%-80%)	T_R/T_F		120	150	ps	2,7
Pulse Width Distortion		PWD			5	%	
Power Supply Rejection Ratio	P_R =0μW (Dark), 5MHz<F<2GHz	PSRR	20			dB	1,8
PD Bias Voltage		PD_{BIAS}	Vcc-1	Vcc	Vcc+0.5	V	
Group Delay	$P_{R,OMA}$ = -12dBm, AC Coupled to R_L=50Ω 2MHz<F<2GHz	Delay	-50		50	ps	9
Deterministic Jitter	$P_{R,OMA}$ = -12dBm, AC Coupled to R_L=50Ω	DJ_{TIA}		30	40	ps	10
Random Jitter	$P_{R,OMA}$ = -12dBm, AC Coupled to R_L=50Ω	RJ_{TIA}		3	5	ps	11

Notes:

1. P_R is the average optical power at the fiber face. No loss in external optical system is assumed; any actual power loss in external optics should be considered in the system design.
2. $P_{R,OMA}$ is the peak to peak optical power at the fiber face (Optical Modulation Amplitude)
$P_{R,OMA} \equiv \frac{2P_R(ER-1)}{ER+1}$ where ER is the extinction ratio (linear) of the optical source.
3. Bandwidth and Low Frequency Cutoff are measured with a small signal sinusoidal light source with –12dBm average power
4. RMS input referred optical noise equivalent power is obtained by measuring the RMS output noise into a 1875 MHz, 4-pole Bessel-Thompson filter then dividing by the responsivity. A scaling factor of 14 is used to predict a BER of 10^{-12}.
5. Sensitivity is measured with an optical source with an extinction ratio of 3dB.
6. Stressed receiver sensitivity is measured with 3.5dB vertical eye closure (intersymbol interference) and with 0.3UI of jitter added. The measurement technique is defined in IEEE 802.3ae.
7. Rise/Fall times are corrected for optical source Rise/Fall times. $T_{TIA}^2 = T_{MEASURED}^2 - T_{OPTICAL}^2$

8. Value shown is with no external power supply filtering.
9. Group delay is a sensitive measurement to package interface, and includes the effects of PD, TIA and package. Measurement is made with TO leads as short as possible.
10. DJ_{TIA} is specified as contributed DJ by the TIA, obtained from $DJ_{TIA}^2 = DJ_{TOTAL}^2 - DJ_{OPTICAL}^2$
11. RJ_{TIA} is specified as contributed DJ by the TIA, obtained from $RJ_{TIA}^2 = RJ_{TOTAL}^2 - RJ_{OPTICAL}^2$

III. INTERFACE CONNECTION

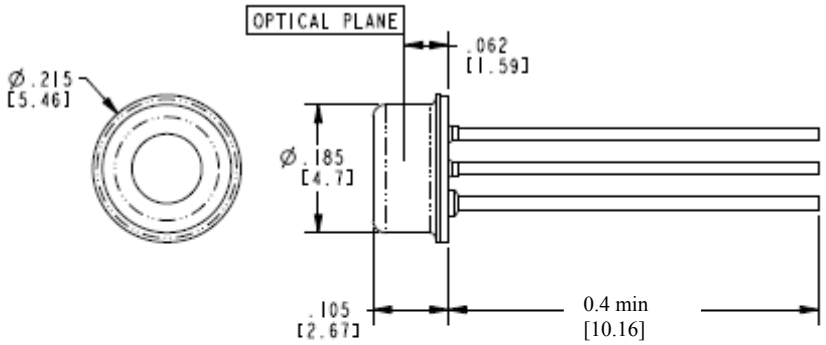


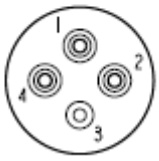
Optional 100W differential termination for high impedance limiting amplifiers is shown in red.

IV. Environmental Specifications

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Case Operating Temperature	T_{op}	-40		85	°C	
Storage Temperature	T_{sto}	-40		85	°C	

IX. Mechanical Specifications





LEAD-END VIEW

PIN #	FUNCTION
1	Vcc
2	VOUT-
3	GND (CASE)
4	VOUT+

XI. Revision History

Revision	Date	Description
A1	4/26/2013	• Document created.

XII. For More Information

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