

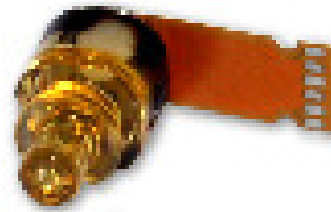
Product Specification

10 Gbps 850nm PIN + Preamp LC ROSA Package

HFD6180-421

PRODUCT FEATURES

- High gain, non-inverting
- LC ROSA package
- High performance GaAs PIN photodiode with separate transimpedance amplifier
- Low electrical parasitic TO46 package
- Data rates up to 10.7Gbps
- Separate detector bias pin can be used for receive
- power monitoring
- Low power dissipation
- Can drive SERDES directly
- Flex circuit interface fits all 10GB MSAs
- RoHS compliant (EU Directive on Restrictions of Hazardous Substances, 2002/95/EC)



The HFD6180-421 uses a high-performance GaAs PIN photo-detector packaged with a transimpedance amplifier designed to meet performance requirements for 10Gbps data communication over multi-mode optical fiber at 850nm. Applications include Ethernet, Fiber Channel and ATM protocols. The optical assembly is designed to interface either 50mm or 62.5mm multi-mode fiber.

The HFD6180-421 is designed to be paired with Advanced Optical Components HFE6192 VCSEL 10Gbps TOSA products (see data sheets for HFE6192 products at www.finisar.com/).

PRODUCT SELECTION

Part Number	Description
HFD6180-421	LC ROSA, with flex. High gain, non-inverting.

I. Absolute Maximum Ratings

Parameter	Rating
Storage Temperature	-40 to +95°C
Case Operating Temperature	-20 to +95°C
Lead Solder Temperature	260°C, 10 sec.
Power Supply Voltage	-0.3V to 3.6V
PIN Voltage	10V
Incident Optical Power	0 dBm average,+4 dBm peak
ESD Exposure (Human Body Model)	225V

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 (Vcc =3.3V, AC coupled to 50W (100W differential), -20°C < TA <95°C unless otherwise specified)

Parameters	Test Condition	Symbol	Min.	Typ.	Max.	Units	Notes
Data Rate		DR			10.7	GBd	1
Input Optical Wavelength	0°C to 70°C	λ_p	830	850	870	nm	
Supply Voltage			2.97	3.3	3.63	V	
Supply Current	$P_R=0\mu W$, $R_L=50\Omega$ AC coupled	I_{CC}		35	50	mA	
PD Bias Voltage		VPD_Bias	3	3.3	3.6	V	10
Photodiode Responsivity	$P_R = -12\text{dBm}$	Resp	0.45	0.5	0.6	A/W	10
Active Area (diameter)				40		μm	
Optical Return Loss	$P_R = -12\text{dBm}$	ORL	12			dB	
Differential Output Voltage Swing	$P_{R,OMA} = -12\text{Bm}$, AC Coupled to $R_L=50\Omega$	$V_{o(pk-pk)}$	60	125	200	mV	2,3
Differential Responsivity	$P_{R,OMA} = -12\text{dBm}$, AC Coupled to $R_L=50\Omega$	T	1000	2000	3000	V/W	2,3
-3dB Optical/Electrical Bandwidth	$P_{R,OMA} = -12\text{dBm}$ Temp = 25°C	BW	7.5	9	12.3	GHz	3,4
Low Frequency -3dB Cutoff	$P_{R,OMA} = -12\text{dBm}$	BW_{LF}			90	KHz	2,3
Output Impedance		Z_{OUT}	40	50	60	Ω	
Sensitivity, OMA		S		-13.5	-12	dBm	5,9
Stressed Sensitivity	Per IEEE802.3ae	$S_{Stressed}$		-11.5	-9	dBm	6
Rise/Fall Time	$P_{R,OMA} = -12\text{dBm}$, (20%-80%)	T_R/T_F		30	50	ps	3,7
Group Delay	Measured from IS211 Phase	GVD	-50		50	ps	
Overload Power		POVLD AVE	0			dBm	
		POVLD OMA	2				
Power Supply Rejection Ratio	$P_R = 0\mu W$ (Dark), Freq = 1000MHz	PSRR		30		dB	2,8

Notes:

- The data rate can be increased to 12.5Gbps, but the sensitivity will be decreased by approximately 3dB
- P_R is the average optical power at the fiber face.
- P_R OMA is the peak to peak optical power at the fiber face (Optical Modulation Amplitude) where ER is the extinction ratio (linear) of the optical source.

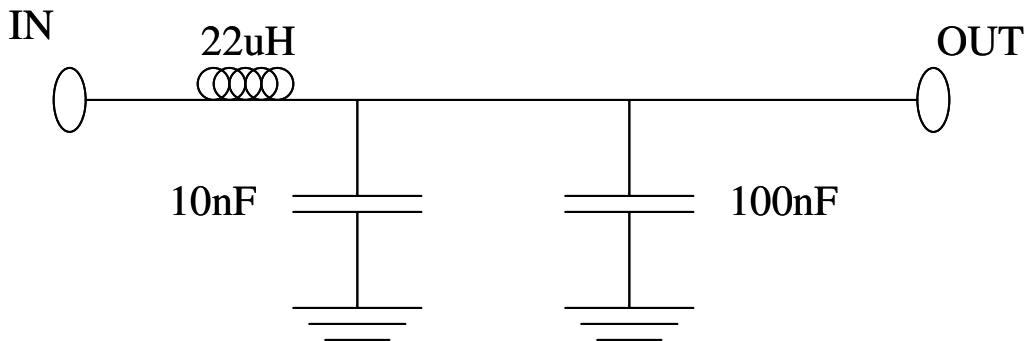
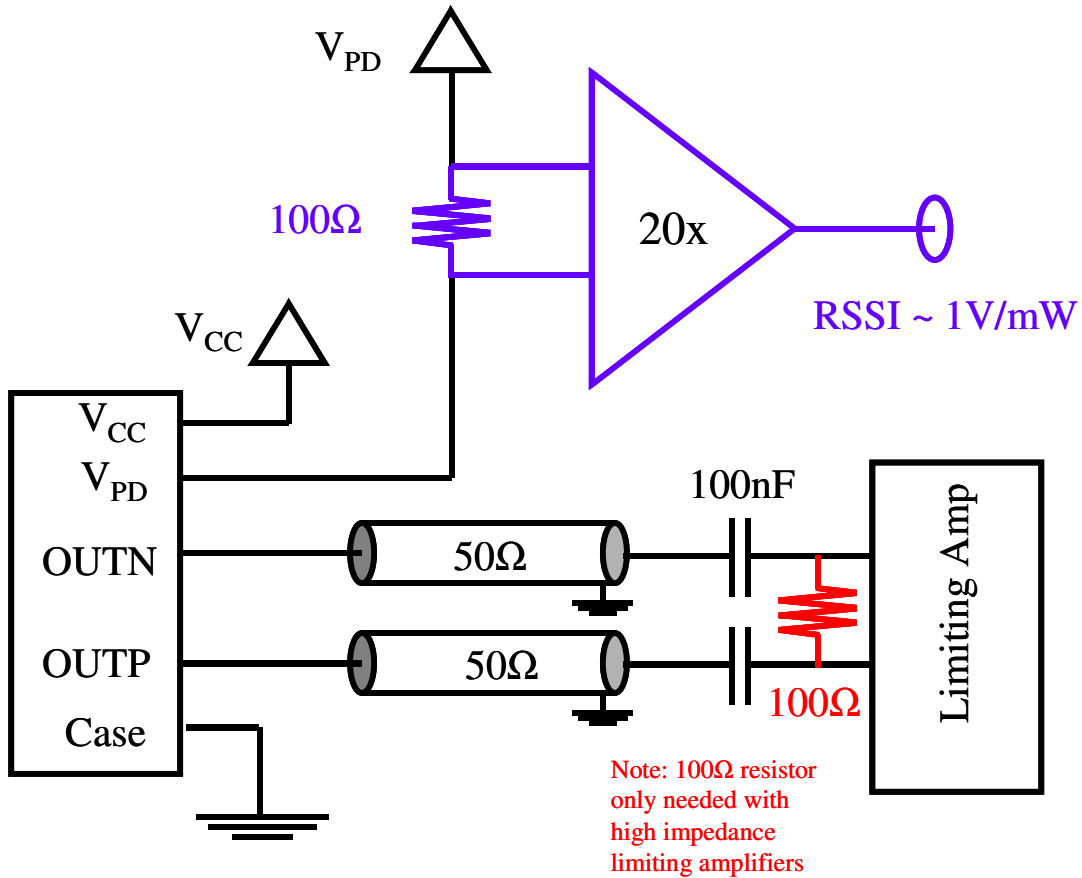
$$P_{R,OMA} = \frac{2P_R ER - 1}{ER + 1}$$

- Bandwidth and Low Frequency Cutoff are measured with a small signal sinusoidal light source with -10dBm average power
- Sensitivity is measured with an optical source with an extinction ratio of 3dB.
- 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.
- 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 external power supply filtering.
- For best sensitivity, a limiting amplifier may be required for operation.
- The PD voltage must be connected to a positive 3.3V power supply (nominal).Maximum

III. Recommended interface circuit for the HFD6180-421

Optional RSSI implementation is shown in blue.

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



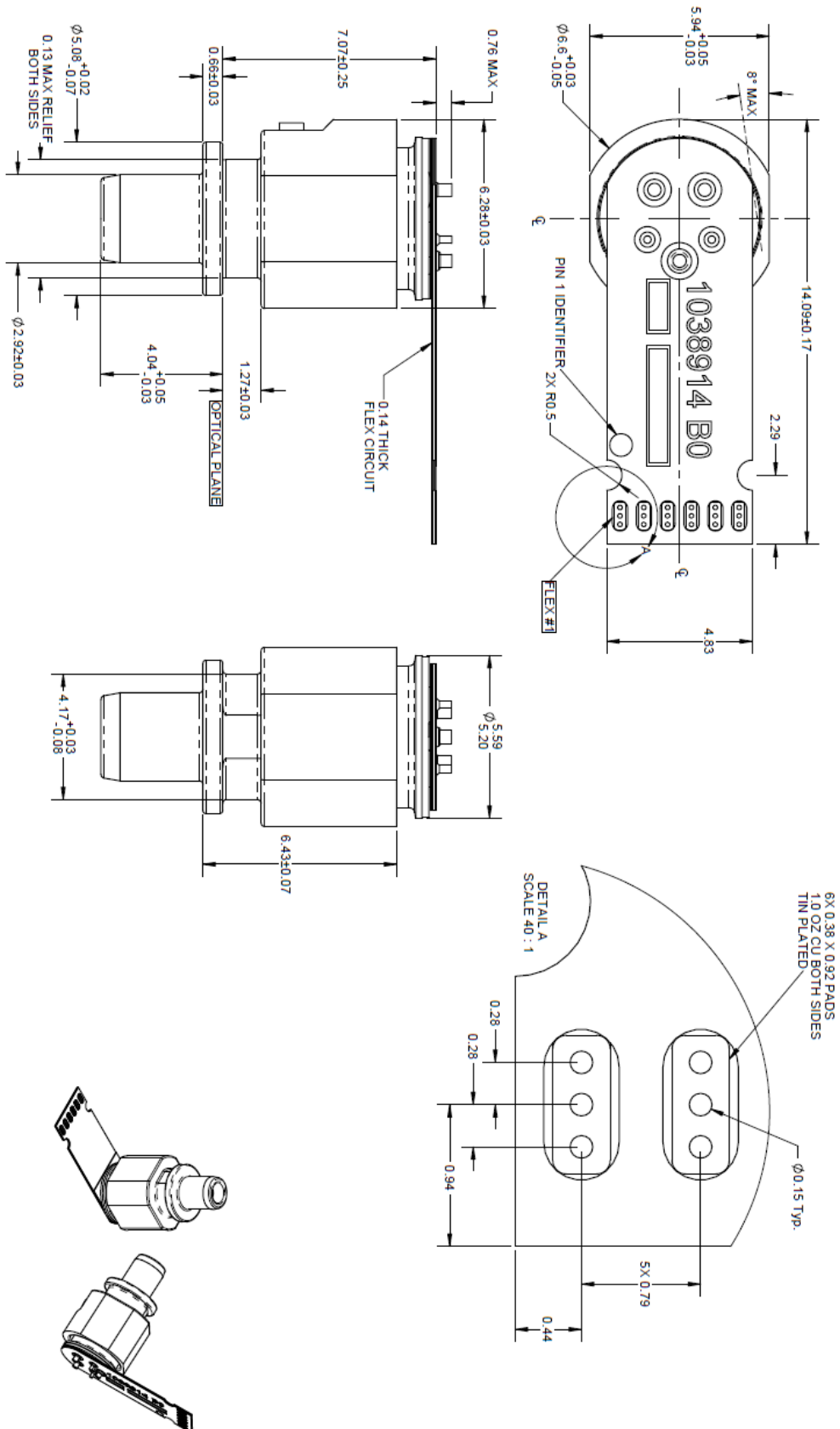
IV. Environmental Specifications

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Case Operating Temperature	T _{op}	-20		95	°C	
Storage Temperature	T _{sto}	-40		95	°C	

V. Mechanical Specifications

PIN	Description
1	V _{cc}
2	CASE
3	OUTP
4	OUTN
5	CASE
6	V _{PD}

Mounting Dimensions - LC ROSA with flex



VI. Revision History

Revision	Date	Description
B00	10/6/2014	• Changed to Standard Finisar Format.

VII. For More Information

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