

20 GHz Linear InGaAs PIN, Wide Temperature Qualified

The Optilab PD-20-TQ is a highly linear, 20 GHz bandwidth InGaAs PIN photodetector that is ideal for use in O/E front-ends requiring wide band frequency response. The coplanar waveguide photodiode design optimizes speed and sensitivity for the 1260 nm through 1600 nm wavelength range, and assures a 20 GHz frequency response necessary for digital and analog applications. The front-illuminated mesa-structured PIN design allows a high input power level of up to 40 mW. The PD-20-TQ is available in a standard 2-pin package with K output connector for ease of assembly, and can be ordered with or without the external protective housing. Contact Optilab for more information.

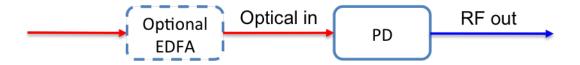
Features

- ➤ Wide bandwidth 60 KHz to 20 GHz
- ➤ Highly Linear to 40 mW+ input power
- ➤ Operating Temperature from -40°C to +75°C
- ➤ High Current Handling up to 35 mA
- ➤ Flat frequency response, ±1 dB
- ➤ Useful Spectral Range 850 nm -1650 nm
- ➤ Hermetically Sealed
- ➤ 1 year warranty standard

Applications

- ➤ Analog RF over Fiber
- ➤ Optically Amplified Systems
- > RZ and NRZ up to 40 Gb/s
- ➤ LIDAR Measurements
- ➤ Coherent Lightwave Systems
- ➤ Front-End O/E Converter for Test Instruments

Functional Diagram



20 GHz Linear InGaAs PIN, Wide Temperature Qualified

OPTIONS

PD-20-TQ-x

Housing Type:
A, No Housing, default;
B, External Housing.
R, ROSA package

TECHNICAL INFO

For technical info and support:

sales@optilab.com

www.optilab.com

Optilab, LLC Phoenix, AZ, USA

WEB ORDER

To order, please visit OEQuest.com.



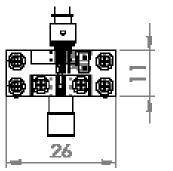
Optilab Advantage

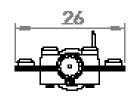
- > Innovation
- ➤ Performance
- ➤ Quality
- > Customization
- ➤ Warranty

Optimized Operating Wavelength Useful Operating Wavelength Optical Input Level 40 mW max. 521 3 dB Bandwidth 17 GHz min., 19 GHz typ. 522 Characteristics < -10 dB @ 20 GHz Repsonsitivity 0.85 A/W @ 1550 nm typ., 0.90 A/W at 1310 nm typ. Dark Current @ 25° C, 5 V 10 nA typ., 100 nA max. Optical Return Loss -30.00 dB typ. Optical PDL @ 1550 nm Optical Fiber SMF-28 Bias Voltage 5 V typ. Impedance Coupling Analog Applications Useful Bandwidth 60 KHz to 20 GHz Ripple over any 1 GHz 2 from Delay 2nd Harmonics Distortion 3rd Harmonics Distortion -75.0 dBc max. Digital Applications Sensitivity @ 10 Gb/s Pacieving Bandwidth Up to 20 Gb/s Data Format RZ, NRZ Mechanical Specifications Operating Temperature -40° C to +75° C Storage Temperature -55° C to +125° C Operating Humidity -40° C to +75° C Storage Temperature -55° C to +125° C Operating Humidity -40° C to +75° C Storage Temperature -55° C to +125° C Operating Humidity -75° C SMF-28 with 900 mm Tube -75° Absolute Maximum Ratings PIN Bias Voltage +2.0 to +7 V -75° C		
Useful Operating Wavelength Optical Input Level 40 mW max. 521 3 dB Bandwidth 17 GHz min., 19 GHz typ. 522 Characteristics < -10 dB @ 20 GHz Repsonsitivity Dark Current @ 25° C, 5 V 10 nA typ., 100 nA max. Optical Return Loss Optical PDL @ 1550 nm Optical Fiber SMF-28 Bias Voltage Bias Voltage SV typ. Impedance 50 Ω Coupling AC-Coupled Analog Applications Useful Bandwidth 60 KHz to 20 GHz Ripple over any 1 GHz 27.0 ps 2nd Harmonics Distortion Digital Applications Useful Bandwidth Digital Applications Sensitivity @ 10 Gb/s Cansing Bandwidth Up to 20 Gb/s Data Format Recieving Bandwidth Up to 20 Gb/s Data Format RZ, NRZ Mechanical Specifications Operating Temperature -50° C to +75° C Storage Temperature -50° C to +125° C Operating Humidity Photodiode Bias Voltage -50 Nm x 20 mm x 14 mm Fiber Connector Optical Fiber SMF-28 Sm x. Optical Fiber SMF-28 S50 Nm x. Optical Fiber SMF-28 S50 Nm x. Optical Fiber SMF-28 S70 DB C To +75° C Storage Temperature -55° C to +125° C Operating Humidity S70 DB C To +75° C Storage Temperature -55° C to +125° C Operating Humidity S70 DB C To +75° C Storage Temperature -55° C to +125° C Operating Humidity S70 DB C To +75° C Storage Temperature -55° C to +125° C Operating Humidity S70 DB C To +75° C Storage Temperature -55° C to +125° C Operating Humidity S70 DB C To +75° C Storage Temperature -55° C to +125° C Operating Humidity S70 DB C To +75° C Storage Temperature -55° C to +125° C Operating Humidity S70 DB C To +75° C Storage Temperature -55° C to +125° C Operating Humidity S70 DB C To +75° DB C	General Specifications	
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S21 3 dB Bandwidth17 GHz min., 19 GHz typ.S22 Characteristics< -10 dB @ 20 GHz		
S22 Characteristics		
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Optical FiberSMF-28Bias Voltage5 V typ.Impedance50 ΩCouplingAC-CoupledAnalog Applications4C-CoupledUseful Bandwidth60 KHz to 20 GHzRipple over any 1 GHz±1.0 dB max.Group Delay±7.0 ps2nd Harmonics Distortion-70.0 dBc max.3rd Harmonics Distortion-75.0 dBc max.Digital ApplicationsSensitivity @ 10 Gb/s-19.0 dBmRecieving BandwidthUp to 20 Gb/sData FormatRZ, NRZMechanical SpecificationsOperating Temperature-40° C to +75° CStorage Temperature-55° C to +125° COperating Humidity85%Photodiode Bias Voltage5 V, ± 1 V DCPackage type2-pin module with K type RF connectorDimensions30 mm x 20 mm x 14 mmFiber ConnectorFC/APCOptical FiberSMF-28 with 900 mm TubeAbsolute Maximum Ratings+2.0 to +7 VForward Current35 mAOptical Input Power Damage Threshold50 mW	Optical Return Loss	-30.00 dB typ.
Bias Voltage 5 V typ. Impedance 50 \(\Omega \) Coupling AC-Coupled Analog Applications Useful Bandwidth 60 KHz to 20 GHz Ripple over any 1 GHz ±1.0 dB max. Group Delay ±7.0 ps 2nd Harmonics Distortion -70.0 dBc max. 3rd Harmonics Distortion -75.0 dBc max. Digital Applications Sensitivity (@ 10 Gb/s -19.0 dBm Recieving Bandwidth Up to 20 Gb/s Data Format RZ, NRZ Mechanical Specifications Operating Temperature -40° C to +75° C Storage Temperature -55° C to +125° C Operating Humidity 85% Photodiode Bias Voltage 5 V, ± 1 V DC Package type 2-pin module with K type RF connector Dimensions 30 mm x 20 mm x 14 mm Fiber Connector FC/APC Optical Fiber SMF-28 with 900 mm Tube Absolute Maximum Ratings PIN Bias Voltage +2.0 to +7 V Forward Current 35 mA Optical Input Power Damage Threshold	Optical PDL @ 1550 nm	0.05 dB max.
Impedance 50 \(\Omega\$ Coupling AC-Coupled Analog Applications Useful Bandwidth 60 KHz to 20 GHz Ripple over any 1 GHz ±1.0 dB max. Group Delay ±7.0 ps 2nd Harmonics Distortion -70.0 dBc max. 3rd Harmonics Distortion -75.0 dBc max. Digital Applications Sensitivity (a) 10 Gb/s -19.0 dBm Recieving Bandwidth Up to 20 Gb/s Data Format RZ, NRZ Mechanical Specifications Operating Temperature -40° C to +75° C Storage Temperature -55° C to +125° C Operating Humidity 85% Photodiode Bias Voltage 5 V, ± 1 V DC Package type 2-pin module with K type RF connector Dimensions 30 mm x 20 mm x 14 mm Fiber Connector FC/APC Optical Fiber SMF-28 with 900 mm Tube Absolute Maximum Ratings PIN Bias Voltage +2.0 to +7 V Forward Current 35 mA Optical Input Power Damage Threshold	Optical Fiber	SMF-28
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Useful Bandwidth Ripple over any 1 GHz Ripple over any 1 GHz ±1.0 dB max. Group Delay 2nd Harmonics Distortion 3rd Harmonics Distortion -75.0 dBc max. Digital Applications Sensitivity @ 10 Gb/s Recieving Bandwidth Up to 20 Gb/s Data Format RZ, NRZ Mechanical Specifications Operating Temperature -40° C to +75° C Storage Temperature -55° C to +125° C Operating Humidity 85% Photodiode Bias Voltage 5 V, ± 1 V DC Package type 2-pin module with K type RF connector Dimensions 30 mm x 20 mm x 14 mm Fiber Connector Optical Fiber Absolute Maximum Ratings PIN Bias Voltage +2.0 to +7 V Forward Current 35 mA Optical Input Power Damage Threshold	Coupling	AC-Coupled
Ripple over any 1 GHz	Analog Applications	
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3rd Harmonics Distortion	Group Delay	±7.0 ps
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Operating Temperature Storage Temperature -55° C to +125° C Operating Humidity 85% Photodiode Bias Voltage 5 V, ± 1 V DC 2-pin module with K type RF connector Dimensions 30 mm x 20 mm x 14 mm Fiber Connector Optical Fiber Absolute Maximum Ratings PIN Bias Voltage +2.0 to +7 V Forward Current Optical Input Power Damage Threshold -40° C to +75° C -55° C to +125° C -50° C to	Data Format	RZ, NRZ
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Package type 2-pin module with K type RF connector Dimensions 30 mm x 20 mm x 14 mm Fiber Connector Optical Fiber Absolute Maximum Ratings PIN Bias Voltage Forward Current Optical Input Power Damage Threshold 2-pin module with K type RF connector 30 mm x 20 mm x 14 mm FC/APC SMF-28 with 900 mm Tube +2.0 to +7 V 50 mW	Operating Humidity	85%
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Fiber Connector Optical Fiber SMF-28 with 900 mm Tube Absolute Maximum Ratings PIN Bias Voltage Forward Current Optical Input Power Damage Threshold FC/APC SMF-28 with 900 mm Tube +2.0 to +7 V 50 mW	Package type	
Optical Fiber SMF-28 with 900 mm Tube Absolute Maximum Ratings PIN Bias Voltage +2.0 to +7 V Forward Current 35 mA Optical Input Power Damage Threshold 50 mW	Dimensions	30 mm x 20 mm x 14 mm
Absolute Maximum Ratings PIN Bias Voltage +2.0 to +7 V Forward Current 35 mA Optical Input Power Damage Threshold 50 mW	Fiber Connector	FC/APC
PIN Bias Voltage +2.0 to +7 V Forward Current 35 mA Optical Input Power Damage Threshold 50 mW	Optical Fiber	SMF-28 with 900 mm Tube
Forward Current 35 mA Optical Input Power Damage Threshold 50 mW	Absolute Maximum Ratings	
Optical Input Power Damage Threshold 50 mW	PIN Bias Voltage	+2.0 to +7 V
Threshold	Forward Current	35 mA
Lead Soldering Temp (10 s) 250 ° C		50 mW
	Lead Soldering Temp (10 s)	250 ° C

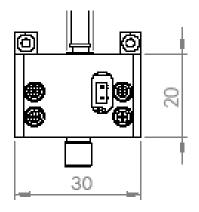
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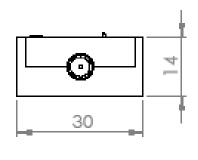
PD-20 Mechanical Drawing³



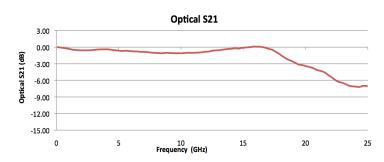


PD-20 Mechanical Drawing w/ External Housing⁴

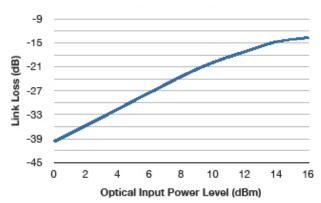




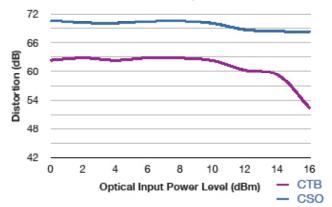
S21 O/E Response¹



Link Loss



CSO, CTB Linearity Measurement²



- ¹ Measured by Agilent 86030A Lightwave Component Analyzer
- ² 40 Channel Analog Channel Loading
- ³ All measurements are in Metric
- ⁴ External housing is for Mechanical Protection Only