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## Product Specification

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### 70 GHz Photodetector

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#### XPDV3120

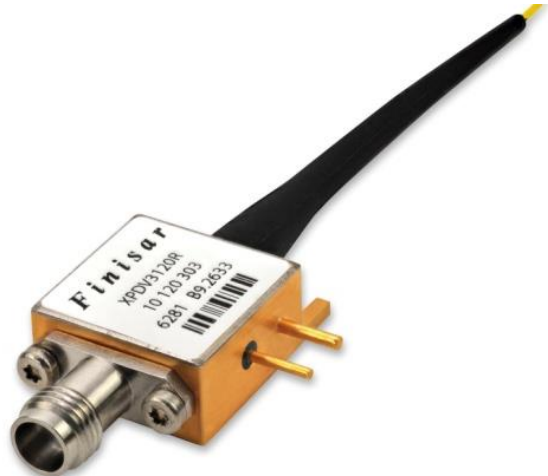
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#### PRODUCT FEATURES

- 70 GHz bandwidth with flat response
- Excellent pulse behavior
- Unsurpassed high-power handling capability
- High responsivity
- Unique on-chip integrated bias network
- Well matched to 50  $\Omega$

#### APPLICATIONS

- Communication systems at 100 Gb/s (OC-768) and beyond
- Microwave photonics up to 60 GHz
- High speed lightwave characterization
- Test & Measurement equipment



The XPDV3120R comprises an optimized 75 GHz waveguide-integrated photodiode, which shows an extremely flat frequency response, both in power and in phase. Finisar's on-chip integrated bias network with an optimized RF-design in particular ensures an undisturbed frequency response from DC to the 3 dB cut-off frequency and saves costs for external bias-tees. The module is especially designed for optimal RF-performance; therefore, the pulse response reveals virtually no ringing. It is best suited for Test & Measurement or Microwave photonics applications up to 60 GHz.

A further advantage of the waveguide structure is the unbeatable high power behavior. The photodetector shows a linear response up to an optical input power of 13 dBm. An output voltage swing of more than 0.5 V<sub>pp</sub> can be achieved for short pulses, without any degradation of the pulse response.

#### ORDERING INFORMATION

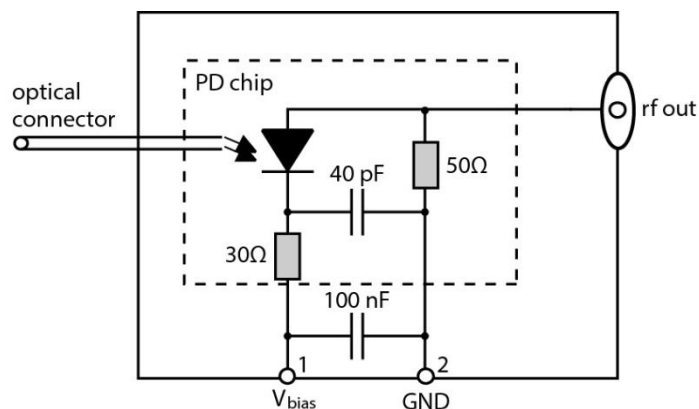
<b>XPDV3120R-Vy-zz</b>
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R:		internal 50 $\Omega$ termination, DC-coupled version
Vy:	VF	= female V Connector® (standard)
	VM	= male V connector® male
zz:	FP	= FC/PC (standard)
		other connectors available upon request

## I. Pin Description

# Pin	Symbol	Description
1	$V_{bias}$	PD bias supply, typical 2.8 V
2	GND	case ground

## II. Block Diagram



## III. Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode Bias Voltage	$V_{PD}$		0		3.5	V
Maximum Average Optical Input Power	$P_{opt}$	non-return-to-zero (NRZ)			16	dBm
Maximum Output Peak Voltage	$V_{peak}$				1.5	V
Electro Static Discharge	$V_{ESD}$	C= 100 pF, R= 1.5 kΩ HBM	-250		250	V
Fiber Bend Radius			16			mm



### 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.

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.

#### IV. Environmental Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Case Temperature	$T_{Case}$		0		70	°C
Relative Humidity	RH	non condensing	5		85	%
Storage Temperature	$T_{sto}$		-40		85	°C

#### V. Operating Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Wavelength Range	$\lambda$		1480		1620	nm
Average Optical Input Power Range	$P_{OPT}$		-20		10	dBm
Photodiode Bias Voltage	$V_{PD}$		2.0	2.8	3.3	V

#### VI. Electro-Optical Specifications<sup>1</sup>

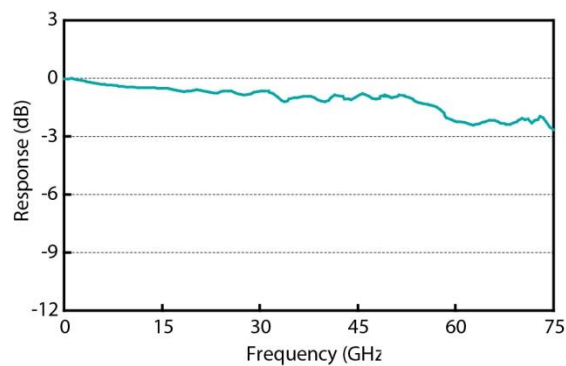
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC Responsivity @1550 nm	R	optimum polarization	0.5	0.6		A/W
Polarization Dependent Loss	PDL			0.3	0.5	dB
Optical Return Loss	ORL		27			dB
3dB Cut-off Frequency	$f_{3dB}$	<sup>2</sup>	68	75		GHz
Output Reflection Coefficient	$S_{22}$	0.05 - 50 GHz		-10	-8	dB
Photodiode Dark Current	$I_{dark}$	$T_{case} = 25\text{ °C}$		5	200	nA
Pulse Width		<sup>3</sup>		7.5	8.5	ps

Notes:

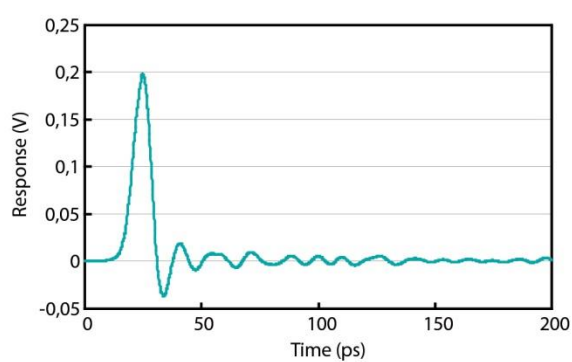
- $\lambda = 1550\text{ nm}$ ,  $V_{bias} = 2.8\text{ V}$ ,  $T_{case} = 25\text{ °C}$
- measured using Agilent 86030A 50GHz Lightwave component analyzer and heterodyne measurement system
- Measured using Tektronix oscilloscope with 70 GHz sampling head

#### VII. Typical Performance Curves

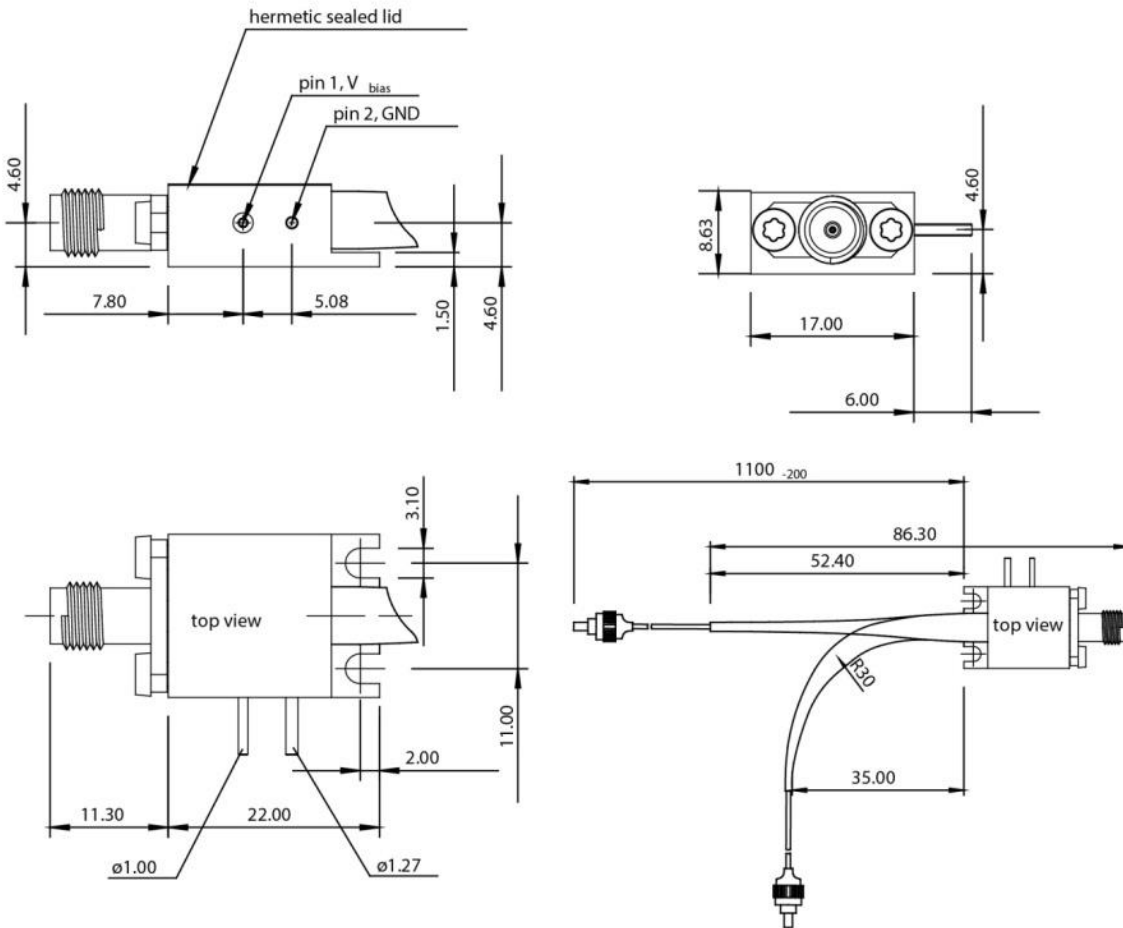
Frequency Response



Pulse Response



## VIII. Mechanical Specifications



## IX. Accessories

For optimum performance, in particular at high optical input levels, we recommend the use of our separately available photodetector power supply - PPS-03.

### PPS-03-X

X:

specifies matching photodetector type  
= XPDV series

Consists of 1x PPS and 1x cable X-type,  
All PPS versions include two 1.5 V batteries  
and a BNC-to-female connector plug cable.



**X. Revision History**

Revision	Date	Description
A1	04/09/2014	<ul style="list-style-type: none"><li>Document created.</li></ul>

**Notes**

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- Finisar Corporation reserves the right to make changes without notice.

**For More Information**

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