

# Preliminary Product Specification

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## 70GHz Dual-window Photodetector

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### XPDV3320R

#### PRODUCT FEATURES

- 70GHz typical electrical 3dB bandwidth
- Excellent flat response
- Support of 1310nm and 1550nm
- Well matched 50Ω output
- Unique on-chip integrated bias network

#### APPLICATIONS

- Communication system up to 600Gb/s
- High-speed Lightwave characterization
- Microwave photonics up to 60GHz
- Test & Measurement equipment



Picture shows product package but may differ in details such as the label

The XPDV3x20R comprises an optimized 70GHz dual window waveguide-integrated photodiode, which shows an extremely flat frequency response, both in power and in phase. II-VI’s on-chip integrated bias network with an optimized RF-design ensures an undisturbed frequency response from DC to the 3dB cut-off frequency and saves costs for an external bias-tee. The hermetic module is especially designed for use in optical windows at 1310nm and 1550nm and optimal RF-performance. The pulse response reveals virtually no ringing. It is best suited for Test & Measurement or Microwave photonics applications up to 60GHz.

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 10dBm. An output voltage swing of more than 0.5V<sub>pp</sub> can be achieved for short pulses, without any degradation of the pulse response.

#### PRODUCT SELECTION

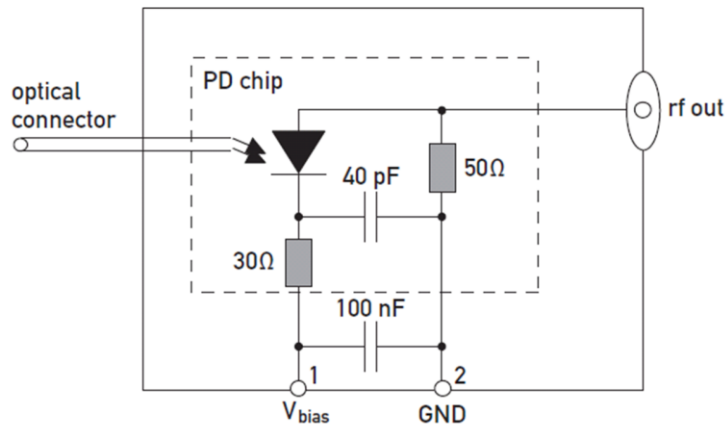
**XPDV3320R-Vy-zz**

- |     |    |   |
|-----|----|---|
| R:  |    | = internal 50Ω termination, DC-coupled version                              |
| Vy: | VF | = female V connector® (standard)  |
|     | VM | = male V connector® male  |
| zz: | FP | = FC/PC (standard)  |
|     |    | available connectors: FA-FC/APC,<br>other connectors available upon request |

## I. Pin Descriptions

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

## II. Block Diagram



## III. Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode Bias Voltage	$V_{bias}$	—	0		4.0	V
Maximum Average Optical Input Power	$P_{opt}$	Continuous wave (CW) or 40Gb/s NRZ			16	dBm
Maximum Peak Optical Input Power	$P_{peak}$	Pulse <25ps or 40Gb/s RZ			19	dBm
Electro Static Discharge (ESD)	$V_{ESD}$	C= 100pF, R= 1.5kΩ HBM	-250		+250	V
Fiber Bend Radius			16			mm

#### IV. Environmental Specifications

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Case Temperature	$T_{Case}$		0		75	°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	$\lambda$		1300	1310	1330	nm
			1525	1550	1575	
Average Optical Input Power Range	$P_{OPT}$				10	dBm
Photodiode Bias Voltage	$V_{bias}$		2.0	2.8	3.3	V

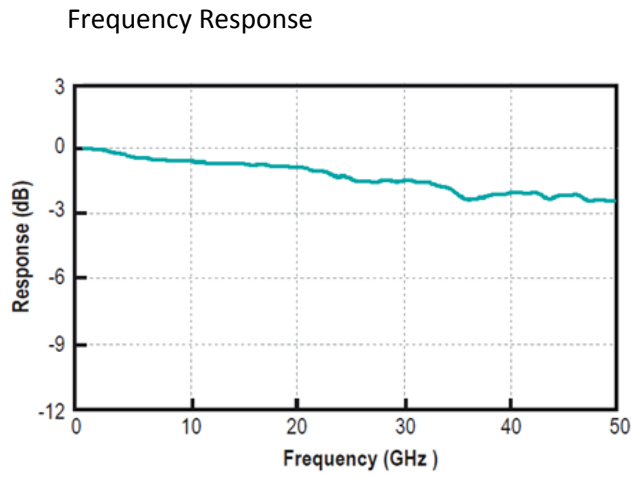
#### VI. Electro-Optical Specifications<sup>1</sup>

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC Responsivity	R	1310nm	0.30	0.45		A/W
		1550nm	0.45	0.65		
Polarization Dependent Loss	PDL	1310nm		0.4	0.7	dB
		1550nm		0.3	0.6	
Optical Return Loss	ORL	1550nm	27			dB
3dB Cut-off Frequency <sup>2</sup>	$f_{3dB}$		65	70		GHz
Output Reflection Coefficient	$S_{22}$	0.05 - 30GHz		-12	-8	dB
		30 - 50GHz		-10	-6	
Photodiode Dark Current	$I_{dark}$			5	200	nA

Notes:

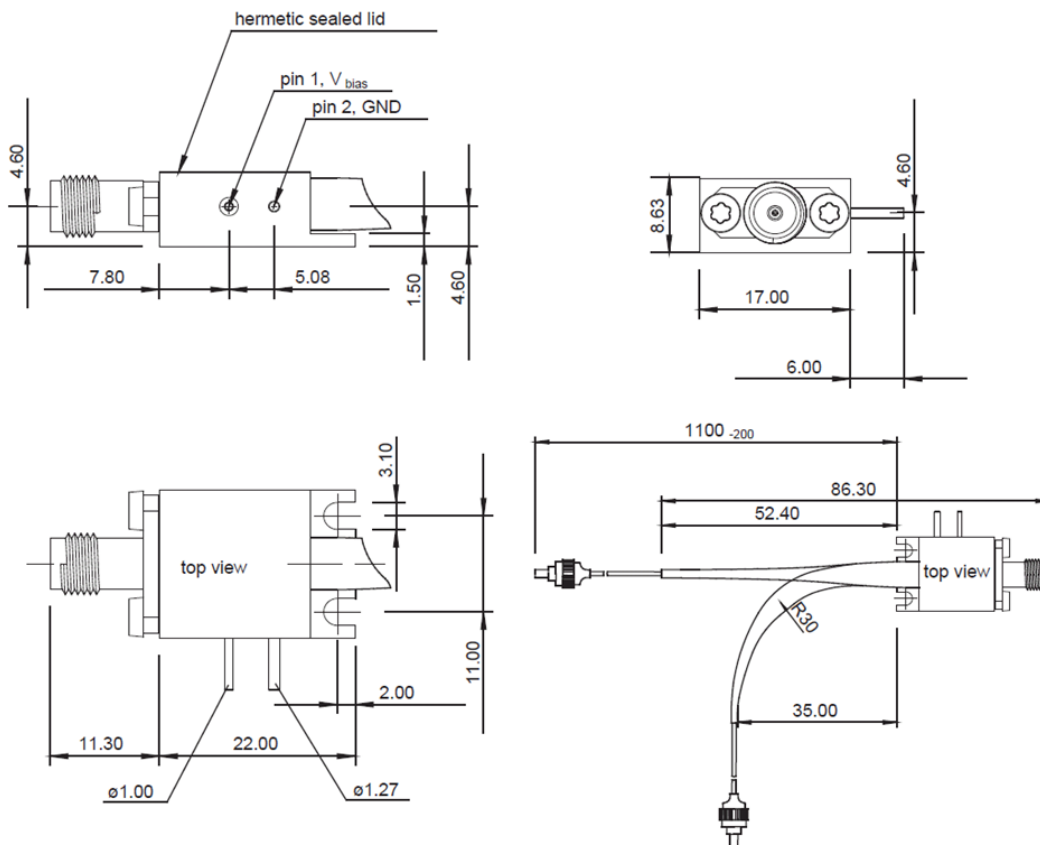
- $\lambda = 1550\text{nm}$  or  $1310\text{nm}$ , VPD = 2.8V, Tcase = 25 °C, optical input power -3dBm
- Measured using Agilent N4373D 67 GHz Lightwave component analyzer

### VII. Typical Performance Behavior



### VIII. Mechanical Specifications

All Dimensions in mm



Parameter	Description
Signal fiber	Standard SMF-28, 900 $\mu$ m loose buffer, yellow

## IX. Accessories

Usage of II-VI's individually accessible photodetector power supply (PPS) is recommended, in particular for optimized performance at high optical input levels. As a portable device it provides stable biasing voltage supply and a front display for review on photocurrent.

## ORDERING INFORMATION

### PPS-03-X

- X: Power supply for XPDV2xxxR/3xxxR series consists of 1x PPS and 1x cable X-type, all PPS versions include two 1.5V batteries and a BNC-to-female connector plug cable



## Notes

- Any trademarks used in this document are properties of their respective owners.
- II-VI Incorporated reserves the right to make changes without notice.

## X. Revision History

Revision	Date	Description
A03	2020-03-05	Transition to II-VI template

### Ordering Information:



800 Village Walk #316  
 Guilford, CT 06437  
 Ph: 203-401-8093

Email orders to: [sales@xsoptix.com](mailto:sales@xsoptix.com)  
 Fax orders to: 800-878-7282