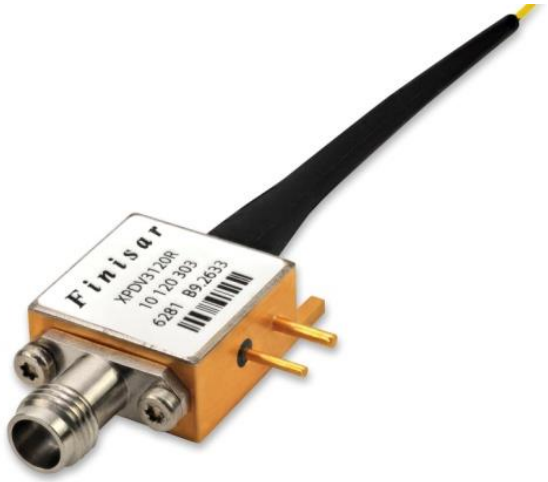
Product Specification

70GHz Photodetector

XPDV3120R

PRODUCT FEATURES

- 70GHz typical bandwidth with flat response
- Excellent pulse behavior
- High responsivity
- Unique on-chip integrated bias network



APPLICATIONS

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

The XPDV3120R comprises an optimized 70GHz 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 in particular ensures an undisturbed frequency response from DC to the 3dB cut-off frequency and saves cost for an external bias-tee. The hermetic 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 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 $0.5V_{pp}$ can be achieved for short pulses, without any degradation of the pulse response.

PRODUCT SELECTION

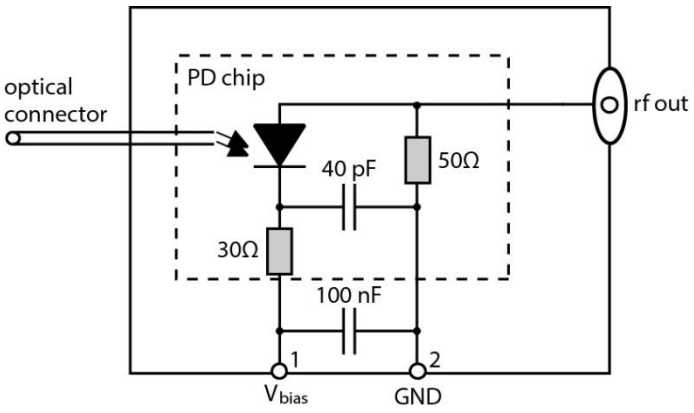
XPDV3120R-Vy-zz

R:		= internal 50Ω termination, DC-coupled version
Vy:	VF	= female V connector® (standard)
	VM	= male V connector® male
zz:	FP	= FC/PC (standard)
		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) 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	λ		1525		1575	nm
Average Optical Input Power	P_{OPT}				10	dBm
Photodiode Bias Voltage	V_{PD}		2.0	2.8	3.3	V

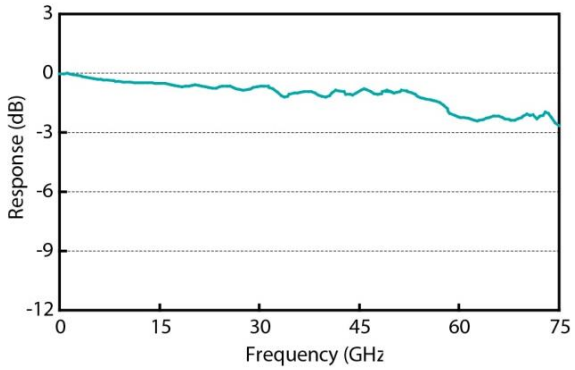
VI. Electro-Optical Specifications[1]

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC Responsivity	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[2]	f_{3dB}		65	70		GHz
Output Reflection Coefficient	S_{22}	0.05 – 35 GHz		-12	-8	dB
		35 - 50 GHz		-10	-6	dB
Photodiode Dark Current	I_{dark}	T_{case}= 25°C		5	200	nA

Notes:
1. λ = 1550nm, V_{bias} = 2.8V, T_{case}= 25°C, P_{OPT} = -3dBm
2. Measured using heterodyne measurement system

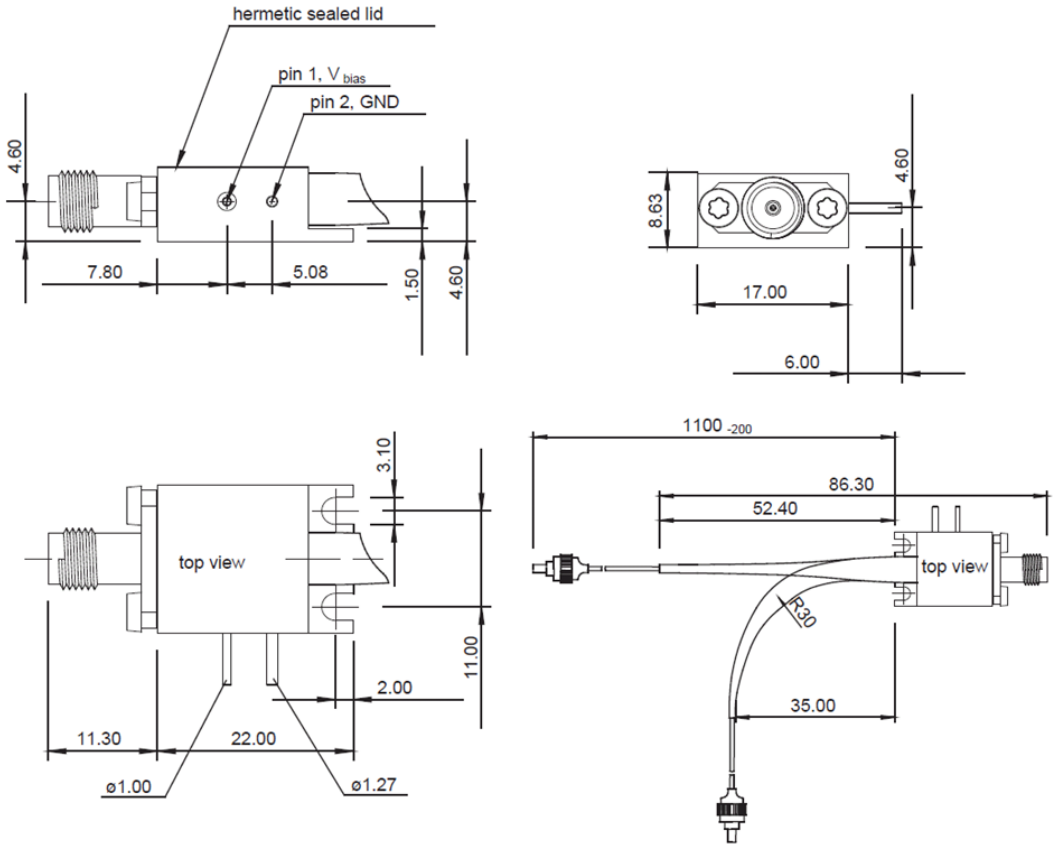
VII. Typical Performance

Frequency Response



VIII. Mechanical Specifications

All Dimensions in mm



Parameter	Description
Signal fiber	Standard SMF-28, 900µm 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
A04	2020-01-30	Transition to II-VI template.