

Product Specification

50GHz Photodetector

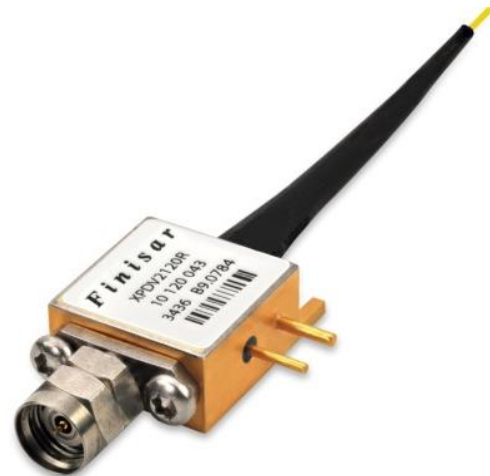
XPDV21x0R(A)

PRODUCT FEATURES

- 50GHz typical bandwidth with flat response
- High linearity
- Excellent pulse behavior
- Well matched 50Ω output
- Unique on-chip integrated bias network

APPLICATIONS

- Metro and long-haul transmission
- Data center interconnect



II-VI's XPDV21x0R (A) platform exhibits an optimized frequency response in both, power and phase. It is ideally suited for OC-768/STM-256 long haul systems. The 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 costs for internal bias-tees. The hermetic module is especially designed for optimal RF performance; therefore the pulse response reveals virtually no ringing. 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, resulting in a high output voltage swing avoiding the need for electrical amplification.

PRODUCT SELECTION

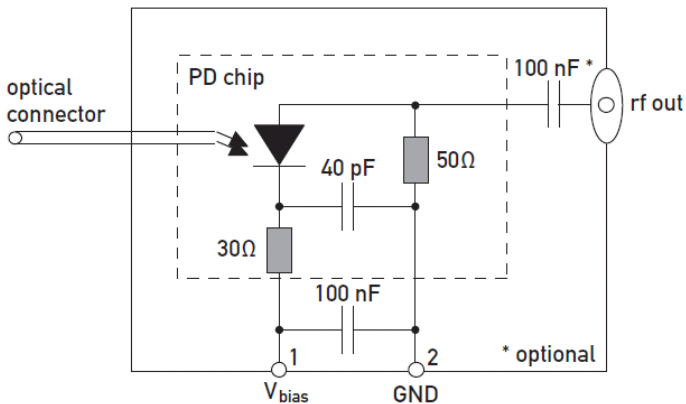
XPDV21x0Rv-Vy-zz

x:	2	= standard PDL
	5	= low PDL, Not as AC-coupled version!
v:	A	= AC-coupled, not as available for 2150!
Vy:	VF	= female V [®] connector (standard)
	VM	= male V [®] connector
zz:	FP	= FC/PC connector (standard)
		Other available choices are: FA-FC/APC
		Customized configurations 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 of <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
Average Optical Input Power Range	P_{OPT}				10	dBm
Operating Wavelength Range	λ		1525		1575	nm
Photodiode Bias Voltage	V_{bias}		2.0	2.8	3.3	V

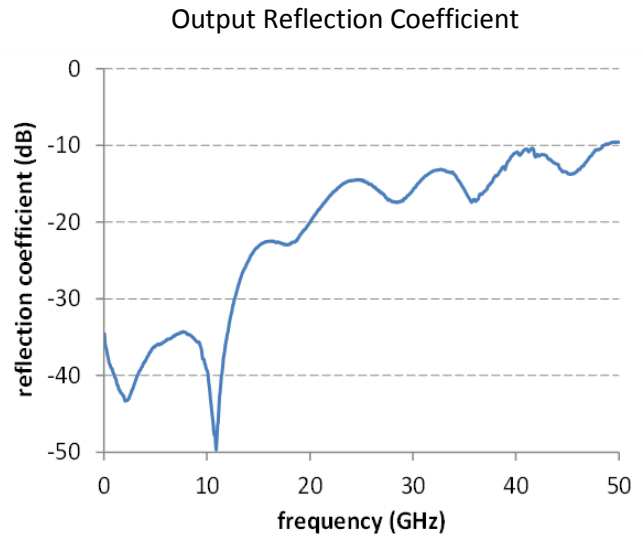
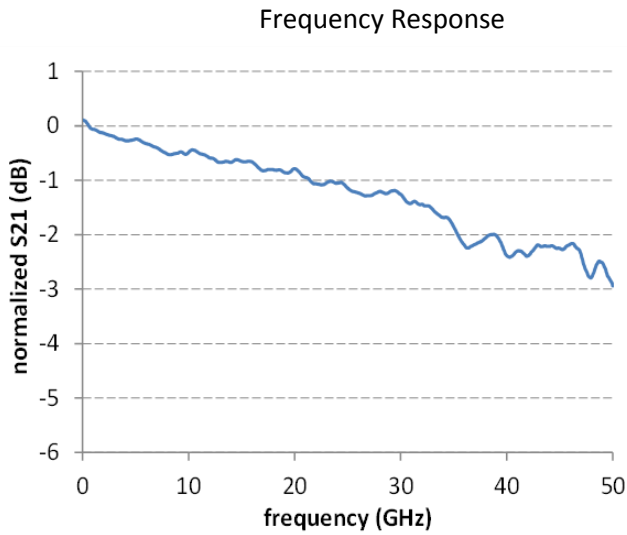
VI. Electro-Optical Specifications¹

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC Responsivity	R	optimum polarization	0.5	0.65		A/W
Polarization Dependent Loss	PDL	XPDV2120R(A)		0.3	0.6	dB
		XPDV2150R		0.1	0.3	dB
Photodiode Dark Current	I_{dark}			5	200	nA
Optical Return Loss	ORL		27			dB
3dB Cut-off Frequency ²	f_{3dB}	XPDV21x0R	45	50		GHz
		XPDV2120RA	32	40		
Output Reflection Coefficient ³	S_{22}	XPDV21x0R		-10	-6	dB
		XPDV2120RA		-8		
Output Peak Voltage ⁴	V_{peak}	50 Ω load $P_{peak}=13dBm$		325		mV

Notes:

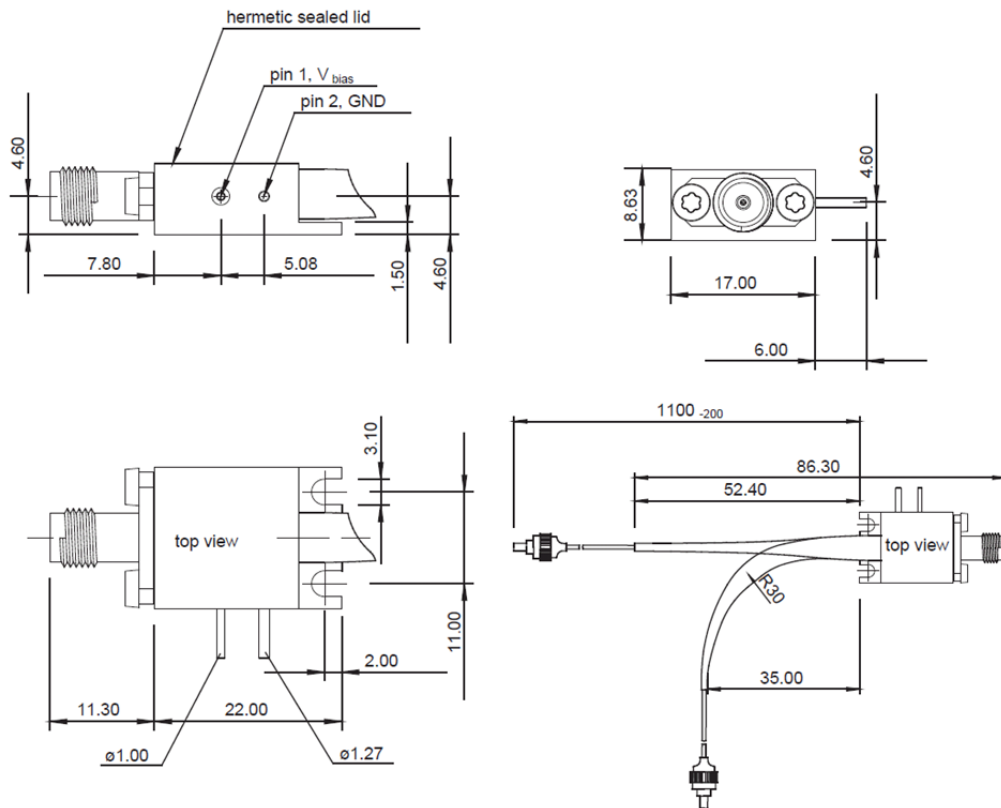
- $\lambda = 1550nm$, $V_{PD} = 3.3V$, $T = 25^{\circ}C$, $P_{OPT} = -3dBm$
- Measured using Agilent N4373D 67GHz Lightwave component analyzer
- 0.05 to 50GHz
- Indicative value, for information only

VII. Typical Performance Behavior



VIII. Mechanical Specifications

All Dimensions in mm



Parameter	Description
Signal fiber	Standard SMF-28, 900µm loose buffer, yellow

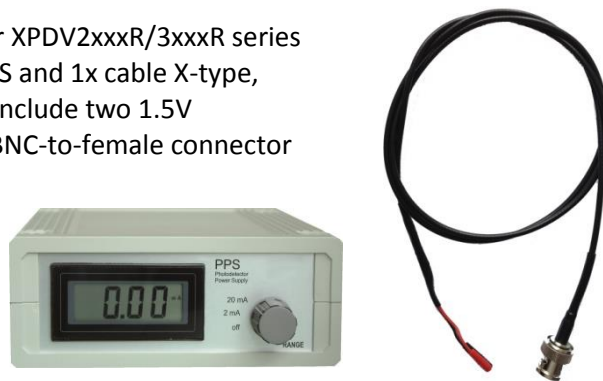
IX. Accessories

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.
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X. Revision History

Revision	Date	Description
A04	2020-01-30	Transition to II-VI template.