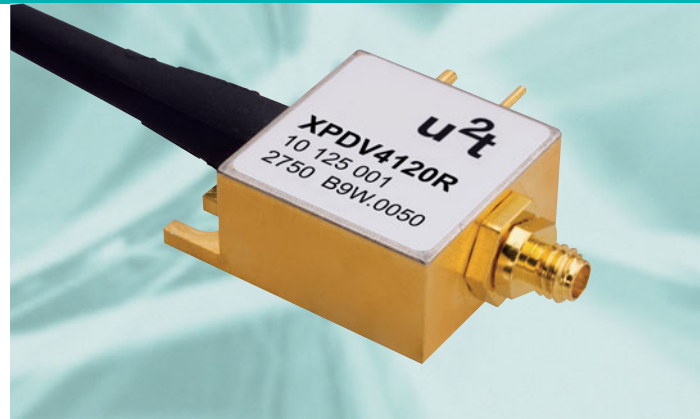


100 GHz Photodetector

Product Code: XPDV4120R



Product Description

The XPDV4120R comprises an optimised 100 GHz waveguide-integrated photodiode, which shows an extremely flat frequency response, both in power and in phase. u²t's on-chip integrated bias network with an optimised RF design in particular ensures an undisturbed frequency response from DC to the 3 dB cut-off frequency and saves costs for internal bias-tees. The 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 behaviour. The photodetector shows a linear response up to an optical input power of 10 dBm. An output voltage swing of more than 0.5 V_{pp} can be achieved for short pulses without any degradation of the pulse response. Each photodetector module is characterised in the frequency domain by using a heterodyne technique. In the time domain, a femtosecond pulse source and a 70 GHz sampling oscilloscope are used to measure the pulse response.

Features

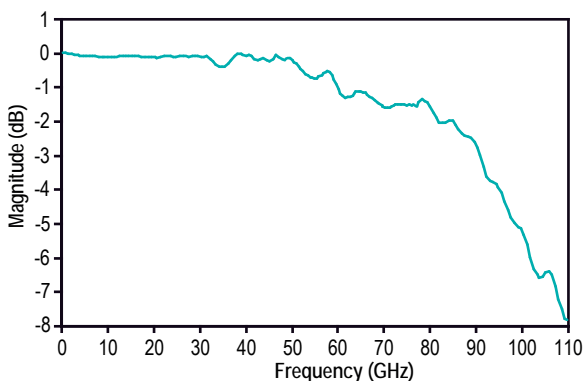
- 90 GHz electrical 3dB bandwidth
- Flat response of up to 100 GHz
- Excellent pulse behaviour
- Well matched 50 Ohm output

Applications

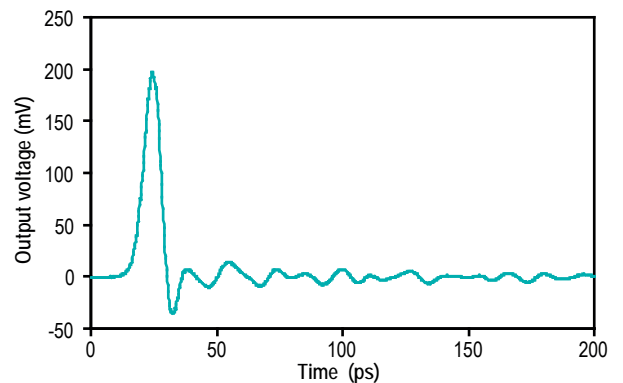
- High-speed lightwave characterisation
- 100 Gbit/s communication systems
- Microwave photonics

Typical Performance

Frequency Response



Pulse Response



Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Storage temperature	T_{stg}	non condensing	-40		+85	°C
Photo diode reverse voltage	V_{PD}				3.5	V
Maximum average optical input power	P_{opt}	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

Operation Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating case temperature range	T_{case}		0		+75	°C
Relative humidity range	RH	non condensing	5		85	%
Operating wavelength range	λ		1480		1620	nm
Average optical input power range	P_{opt}		-20		10	dBm
Photodiode reverse voltage	V_{PD}		1.5	2.0	2.8	V

Optical and Electrical Specifications 1)

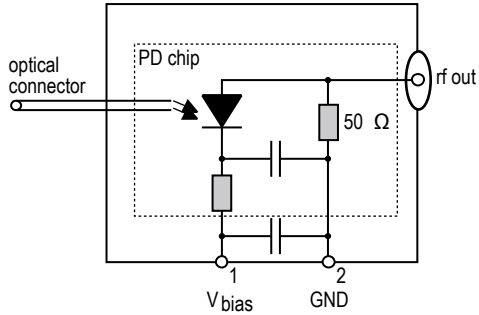
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC responsivity @ 1550 nm	R	optimum polarization		0.5		A/W
Polarization dependent loss	PDL			0.5	0.8	dB
Optical return loss	ORL	$\lambda = 1550$ nm	27			dB
3dB cut-off frequency	f_{3dB}	2)	90	100		GHz
Output reflection coefficient	S_{22}	0.05 - 50 GHz 50 - 110 GHz		-10 -8	-8	dB
Overload	P_{overl}			10		dBm
Photodiode dark current	I_{dark}	$T_{case} = 25^{\circ}C$		5	200	nA
Pulse width		3)		7.5	8	ps

Notes: 1) $\lambda = 1550$ nm, $V_{bias} = 2$ V, $T = 25^{\circ}C$

2) Measured using a heterodyne measurement system

3) Measured using Tektronix oscilloscope with 70 GHz sampling head

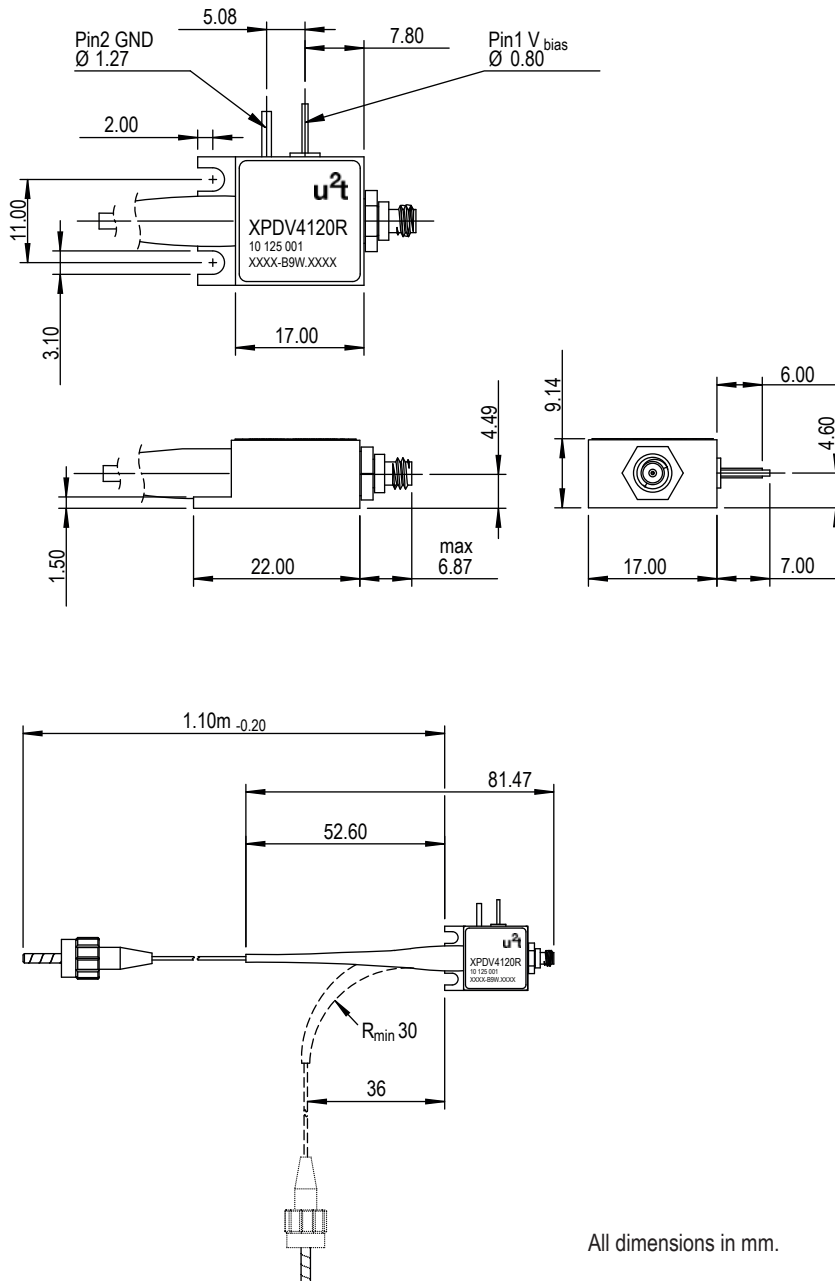
Block Diagram



Pin Description

Pin#	Symbol	Description
1	V_{bias}	bias supply, typ. 2.0 V
2	GND	Case ground

Mechanical Dimensions



All dimensions in mm.

Accessories

PPS-03

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

Further information can be found in the separate datasheet „Photodetector Power Supply“.



Ordering Information

Please use the following table to select your required configuration of the photoreceiver.

XPDV 4120R - WF - ZZ

specifies optical connector
FP = FC/PC (standard)
other connectors available upon request

PPS-03-X4

specifies matching photodetector type
X4 = XPDV4120R series, consists of 1 PPS and 1 cable X-type

All Photodetector Power Supply versions include two 1.5 V batteries and a BNC-to-female connector plug cable.

Headquarters

u2t Photonics AG
Reuchlinstr. 10/11
10553 Berlin, Germany

Phone: +49(30)726113-500
Fax: +49(30)726113-800
E-mail: contact@u2t.com



Regional Sales Partners

USA - East coast

Teracomm
800 Village Walk #296
Guilford, CT 06437
USA

Phone: +1/2032450237
Fax: +1/2032861535
Contact: Michael Carr
E-mail: sales@teracomm.com
<http://www.teracomm.com>

USA - West coast

Amasco
6830 Via Del Oro
Suite 106
San Jose, CA 95119
USA

Phone: +1/408 360 1300
Fax: +1/408 360 1309
Contact: Tom Fry
E-mail: tom@amasco.com
<http://www.amasco.com>

China

Luster Lightwave (Beijing) Corp.
F6, South Tower Newton Office
No. 25 Lan Dian Chang Nan Road
Haidian District
Beijing, 100089
China

Phone: +86/1088400202 Ext. 6101
Cell Phone: +86/13911774855
Fax: +86/1088400260
Contact: Vincent Wang
E-mail: vincentwang@lusterlighttech.com
<http://www.lusterlighttech.com>

Japan

I-Wave Corporation
Nakarin Auto Bldg. 5F
2-8-4 Shinkawa, Chuo-ku
Tokyo, 104-0033
Japan

Phone: +81/335371772
Fax: +81/335371773
Contact: Koichi Shimada
E-mail: shimada@i-waveco.com
<http://www.i-waveco.com>

South Korea

CoreTech Corporation
2nd floor, Jaedang Bldg, 643-1
Bokjeong-Dong, Sujeong-Gu,
Seongnam-Si,
Gyeonggi-Do, 461-200
South Korea

Phone: +82/24465316
Fax: +82/24465326
Contact: Ukhyun Yun
E-mail: coretech@coretk.com
<http://www.coretk.com>

Singapore

Wintek International Pte Ltd
194 Pandan Loop #07-29
Pantech Industrial Complex
Singapore 128383

Phone: +65/67780498
Fax: +65/ 67780368
Contact: Justin Woon
E-mail: justin@wtk-intl.com
<http://www.wtk-intl.com>

Spain

BFI Optilas, S.A.U.
Isabel Colbrand 6
28050 Madrid
Spain

Phone: +34/ 91 453 11 60
Fax: +34/ 91 662 68 37
Contact: Concepcion Marcos
E-mail: concepcion.marcos@bfioptilas.com
<http://www.bfioptilas.com>

France

BFI Optilas France
4, Allée du Cantal
Z.I. La Petite Montagne Sud
CE 1834, 91018 EVRY Cedex
France

Phone: +33/160798928
Fax: +33/160798903
Contact: Pierre Ball
E-mail: Pierre.Ball@bfioptilas.com
<http://www.bfioptilas.fr>