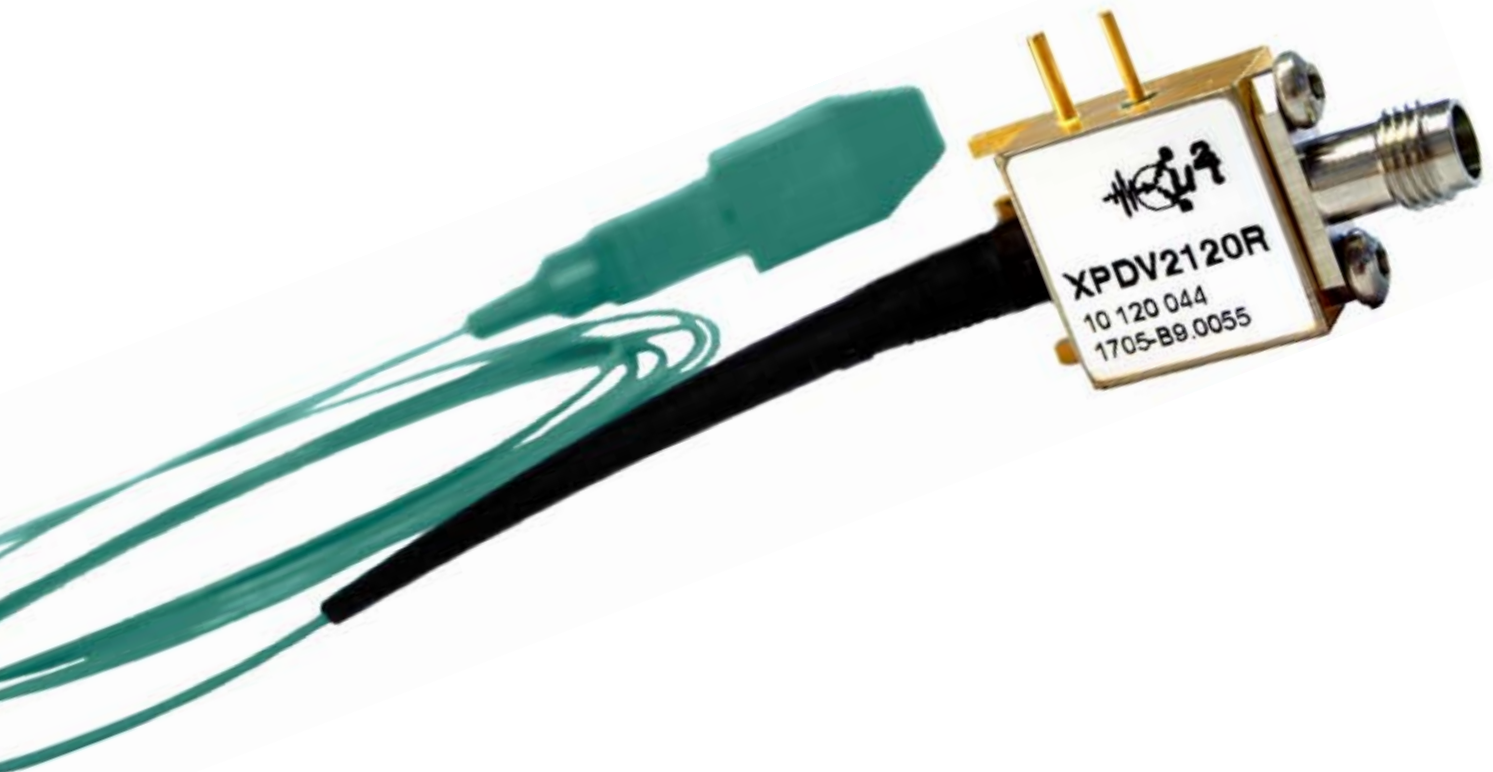


50 GHz Photodetector

Product Code: XPDV21xx



Features

- Highest bandwidth with flat response
- Excellent pulse behavior
- Unsurpassed high-power handling capability
- High responsivity
- Unique on-chip integrated bias network
- Well matched to 50 Ω
- Hermetically sealed package

Applications

- Communication systems at 40 Gbit/s (OC-768) and beyond
- Microwave photonics up to 60 GHz
- High speed lightwave characterization

50 GHz Photodetector

Product Code: XPDV21xx

Product Description

Key element of the u2t XPDV photodetector modules are our well-established waveguide-integrated photodiode chips. They are designed to exhibit an optimized frequency response in both, power and phase. Due to skillful rf-packaging, the pulse response shows almost no ringing. Our integrated on-chip spot size converter leads to a high responsivity and ensures reliability and robustness of the XPDV. A further advantage of the waveguide structure is the unsurpassed high power behavior. A linear response up to an optical input power of 13 dBm is a unique feature of the XPDV photodetector modules. For short pulses an output voltage swing of more than 1 V_{pp} can be achieved, without any degradation of the pulse response.

All u2t's XPDVs contain our unique on-chip integrated bias network. It ensures an undisturbed frequency response from DC to the 3 dB cut-off frequency and saves costs of external bias-tees.

The following brief description of the available XPDV photodetector models should help you to identify which device suits your application best. If you need more information, please send your request to sales@u2t.de.

XPDV2120R

The XPDV2120R is the ultimate photodetector in terms of speed, responsivity and low polarization dependent loss (PDL). The 3 dB electrical bandwidth exceeds 50 GHz. The integrated 50 Ω termination enables impedance matching to your system with minimum ripple in the frequency domain.

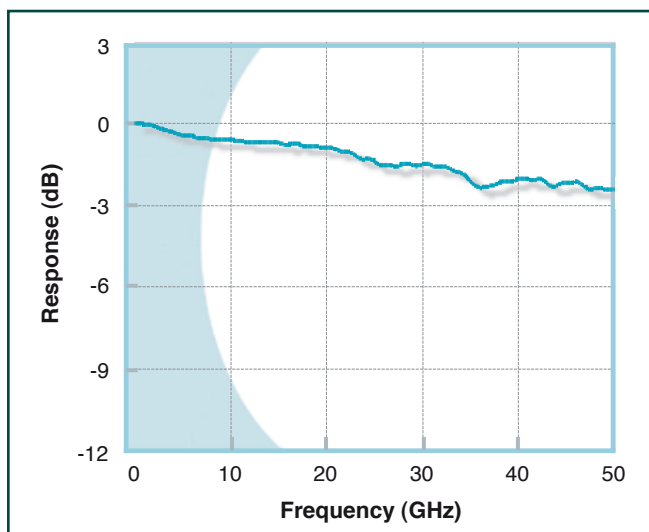
XPDV2120

The XPDV2120 is a device without internal termination. The typical applications are systems or measurements, where the rf-responsivity is more important (6 dB more output power) than a flat frequency response.

For other models please see also datasheet "Low Cost 50 GHz Photodetector" (contains XPDV2040R and XPDV1020R).

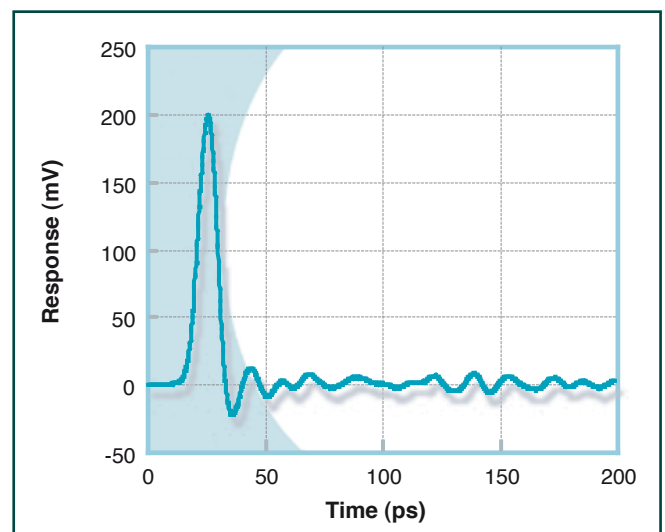
Typical Performance

Frequency Response



Typical frequency characteristics of the XPDV2120R model, measured with Agilent LCA 86030A network analyzer.

Pulse Response



Typical pulse response of an XPDV2120R, measured with a picosecond pulse source (1 ps pulse width, repetition rate 49.86 MHz) and a Tektronix CSA8000 oscilloscope with 80E01 sampling head.

Specifications

Parameter	Unit	XPDV 21x0R			XPDV 21x0			Notes
		Min.	Typ.	Max.	Min.	Typ.	Max.	
3 dB bandwidth female V Connector® male V Connector® AC coupled	GHz	50 48	>50 50 40		40	45		1)
Pulse width	ps		9	10		10	12	1), 2)
Wavelength range	nm	1480		1620	1480		1620	
DC responsivity @ 1550 nm	A/W	0.55	0.65		0.55	0.65		1), 4)
Polarization dependent loss @ 1550 nm XPDV2120(R) XPDV2150(R)	dB dB		0.3 0.1	0.5 0.2		0.3 0.1	0.5 0.2	1), 7), 4)
Dark current	nA		5	50		5	50	1)
Optical input power	mW mean			20			20	1), 2), 3)
Optical return loss	dB	27	30		27	30		5)
S ₂₂ (0.05 - 50 GHz) female V Connector® male V Connector® AC coupled	dB		-10 -10 -8	-8 -8				1), 6)
Reverse bias voltage	V	2.0	2.8	3.3	2.0	2.8	3.3	

Notes:

- 1) $\lambda = 1550$ nm, $V_{bias} = 2.8$ V, $T = 25$ °C
- 2) Measured using a pulse source (1ps pulse width, repetition rate 50 MHz) and a Tektronix CSA 8000 oscilloscope with an 80E01 sampling head
- 3) Change in pulse width is less than 10 %
- 4) DC responsivity @ 1310 nm; 0.42 A/W typ; Polarization dependent loss @ 1310 nm: 0.4 dB typ.
- 5) 1500-1600 nm, optimized for 1550 nm
- 6) For model XPDV 2120 n.a. due to unmatched high impedance output
- 7) XPDV2150(R) available upon request

Absolute Maximum Ratings

Parameter	Unit	Min.	Max.
Reverse bias voltage	V		3.5
Forward current	mA		5
Optical input power	mW mean		50
Maximum output peak voltage	V peak		1.5
Storage temperature	°C	-40	+85
Minimum fiber bend radius	mm	16	

V Connector® is a registered trademark of Anritsu Company.
GPPO™ Connector is a registered trademark of Corning Gilbert Inc.

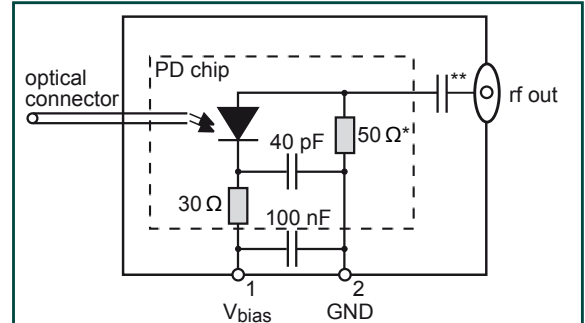
50 GHz Photodetector

Product Code: XPDV21xx

Pin Description

Pin	Description	Comment
1	V _{bias}	typ. 2.8 V
2	GND	Case ground

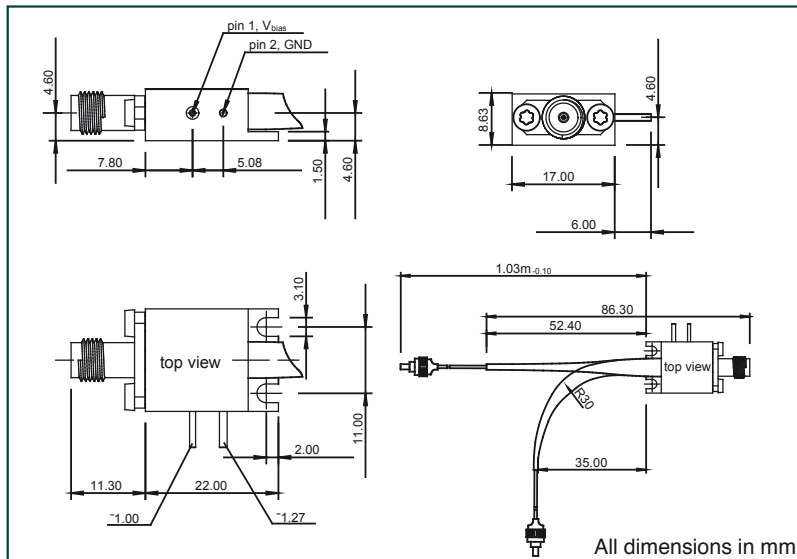
Block Diagram



*) Optional 50 Ω matching resistor

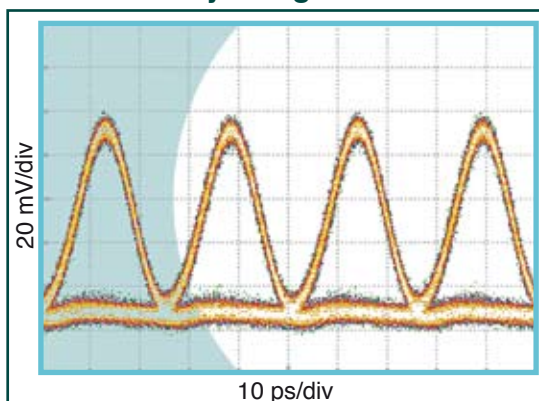
**) Optional blocking capacitor

Mechanical Dimensions

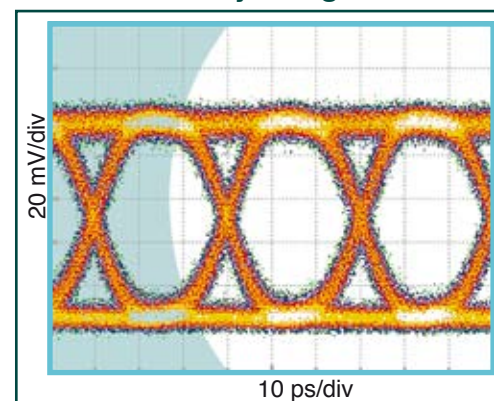


Applications

40 Gbit/s RZ Eye Diagram



40 Gbit/s NRZ Eye Diagram



by courtesy of SHF Communications Technologies AG

40 Gbit/s PRBS signals (2³¹-1) generated by SHF BPG 44E (option low jitter) and 5003 transmitter. Back-to-back measurements of received eye diagrams using 70 GHz digital sampling oscilloscope.

Accessories

BPB-02

All photodetectors are delivered with an easy-to-use battery powered bias-supply - BPB-02. It comes free of charge with each XPDV photodetector. The maximum quantity per order is 5 pcs.

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 balanced photodetector.

XPDV	xxxx	RA	yy	zz	
					specifies optical connector
					FP = FC/PC (standard) SP = SC/PC
					FA = FC/APC SA = SC/APC
					LP = LC/PC
					other connectors available upon request
					specifies rf connector
					VF = female V Connector® (standard)
					VM = male V Connector®
					specifies termination resistor
					R = internal 50 W termination resistor, DC-coupled version
					RA = internal 50 W termination resistor, AC-coupled version
					blank = no termination resistor
					product specification
					available types:
					2120 = standard 2150 = low PDL version upon request
					for other models see datasheet "Low Cost 50 GHz Photodetector"

PPS-03 - X

specifies matching photodetector type

X = XPDV 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

Germany

u2t Photonics AG
Reuchlinstrasse 10/11
10553 Berlin
Germany
Phone: +49/30 726 113-530
Fax: +49/30 726 113-800
E-mail: sales@u2t.de
http://www.u2t.com

Regional Sales Partners

USA - East coast

Teracomm
800 Village Walk #296
Guilford, CT 06437
USA
Phone: +1/203 672 5943
Fax: +1/203 286 1535
Contact: Michael Carr
E-mail: sales@teracomm.com
http://www.teracomm.com

USA - West coast

Amasco
2320A Walsh Ave.
Building H
Santa Clara, CA 95051
USA
Phone: +1/408 987 7760
Fax: +1/408 987 7769
Contact: Tom Fry
E-mail: sales@amasco.com
http://www.amasco.com

Japan

I-Wave Corporation
2-21-13 UT-Building 2F
Higashiueno, Taito-ku,
Tokyo 111-0015
Japan
Phone: +81/3 5812 7401
Fax: +81/3 5812 7402
Contact: Koichi Shimada
E-mail: shimada@i-waveco.com
http://www.i-waveco.com

China

Luster LightWave (Beijing) Corp.
F6, South Tower Newton Office
No. 25, Lan Dian Chang Nan Road
Haidian District
Beijing, 100089
China
Phone: +86/10 8840 0202
Fax: +86/10 8840 0260
Cell Phone: +86/139 1177 4855
Contact: Vincent Wang
E-mail: vincentwang@lusterlighttech.com
http://www.lusterlighttech.com

South Korea

CoreTech Corporation
7th floor, Taerim Bldg, 680-24
Jayang-2 Dong, Gwangjin-Gu,
Seoul, Korea
Phone: +82/2 446 5316
Fax: +82/2 446 5326
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: +65/67 78 04 98
Fax: +65/67 78 03 68
Contact: Justin Woon
E-mail: sales@wtk-intl.com
http://www.wtk-intl.com

Israel

Lahat Technologies
Teradion Industrial-Zone
Misgav 20179
Israel
Phone: +972/4 999 0151
Fax: +972/4 999 0826
Contact: Eyal Seroussi
E-mail: sales@lahat.co.il or
eyal@lahat.co.il
http://www.lahat.co.il

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@bfiophtilas.com
http://www.bfiophtilas.com

France

BFI Optilas France
4, Allée du Cantal
Z.I. La Petite Montagne Sud
CE 1834, 91018 EVRY Cedex
France
Phone: +33/160 79 59 15
Fax: +33/160 79 89 03
Contact: Jean Beguin
E-mail: jean.beguina@bfiophtilas.com
http://www.bfiophtilas.fr/

We reserve the right to change the specifications without notice.