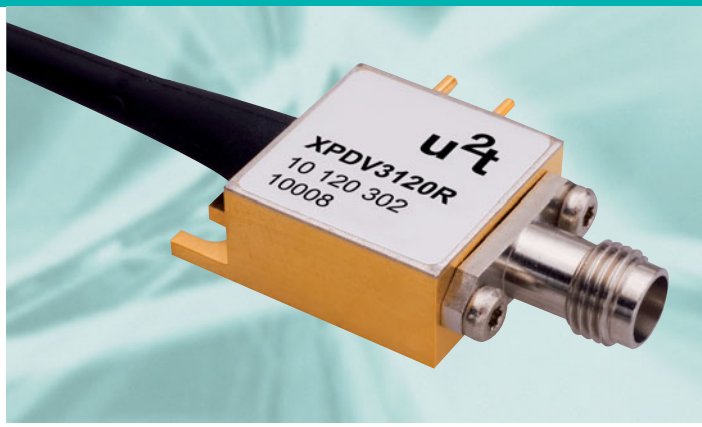
Preliminary Datasheet



70 GHz Photodetector

Product Code: XPDV3120R

Product Description

The XPDV3120R comprises an optimized 75 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 optimized rf-design in particular ensures an undisturbed frequency response from DC to the 3 dB cut-off frequency and saves costs for external bias-tees. The 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 60 GHz.

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 13 dBm. An output voltage swing of more than 0.5 Vpp can be achieved for short pulses, without any degradation of the pulse response.

Features

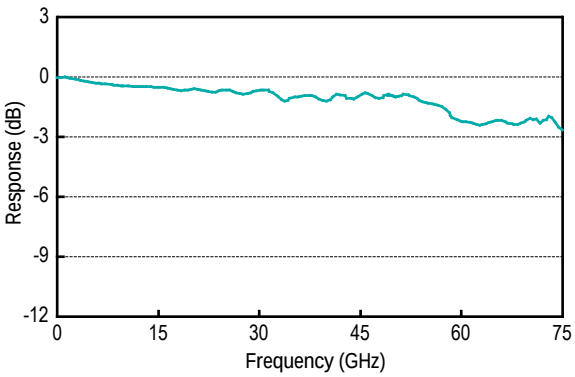
- 70 GHz bandwidth with flat response
- Excellent pulse behavior
- Unsurpassed high-power handling capability
- High responsivity
- Unique on-chip integrated bias network
- Well matched to 50 Ω
- Hermetically sealed package

Applications

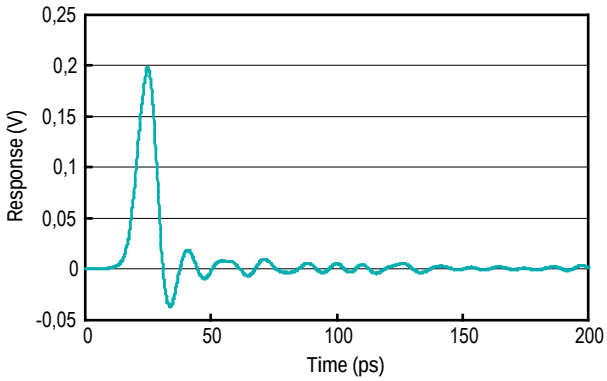
- Communication systems at 100 Gbit/s (OC-768) and beyond
- Microwave photonics up to 60 GHz
- High speed lightwave characterization
- Test & Measurement equipment

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}		0		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

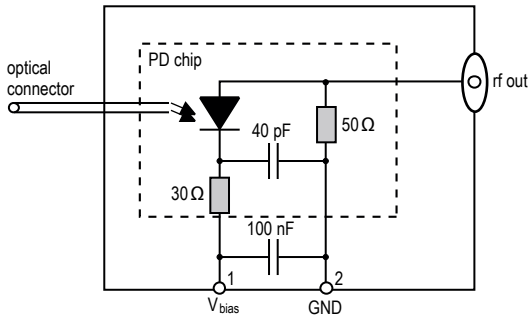
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating case temperature range	T_{case}		0		+70	°C
Relative humidity range	RH	Non condensing	5		85	%
Operating wavelength range	λ		1480		1620	nm
Average optical input power range	P_{opt}		-20		13	dBm
Photodiode reverse voltage	V_{PD}		2.0	2.8	3.3	V

Optical and Electrical Specifications 1)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC responsivity @ 1550 nm	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	f_{3dB}	2)	68	75		GHz
Output reflection coefficient	S_{22}	0.05 - 50 GHz		-10	-8	dB
Photodiode dark current	I_{dark}	T_{case} = 25°C		5	200	nA
Pulse width		3)		7.5	8.5	ps

Notes: 1) λ = 1550 nm, V_{bias} = 2.8 V, T = 25°C
2) Measured using Agilent 86030A 50GHz Lightwave component analyzer and heterodyne measurement system
3) Measured using Tektronix oscilloscope with 70 GHz sampling head

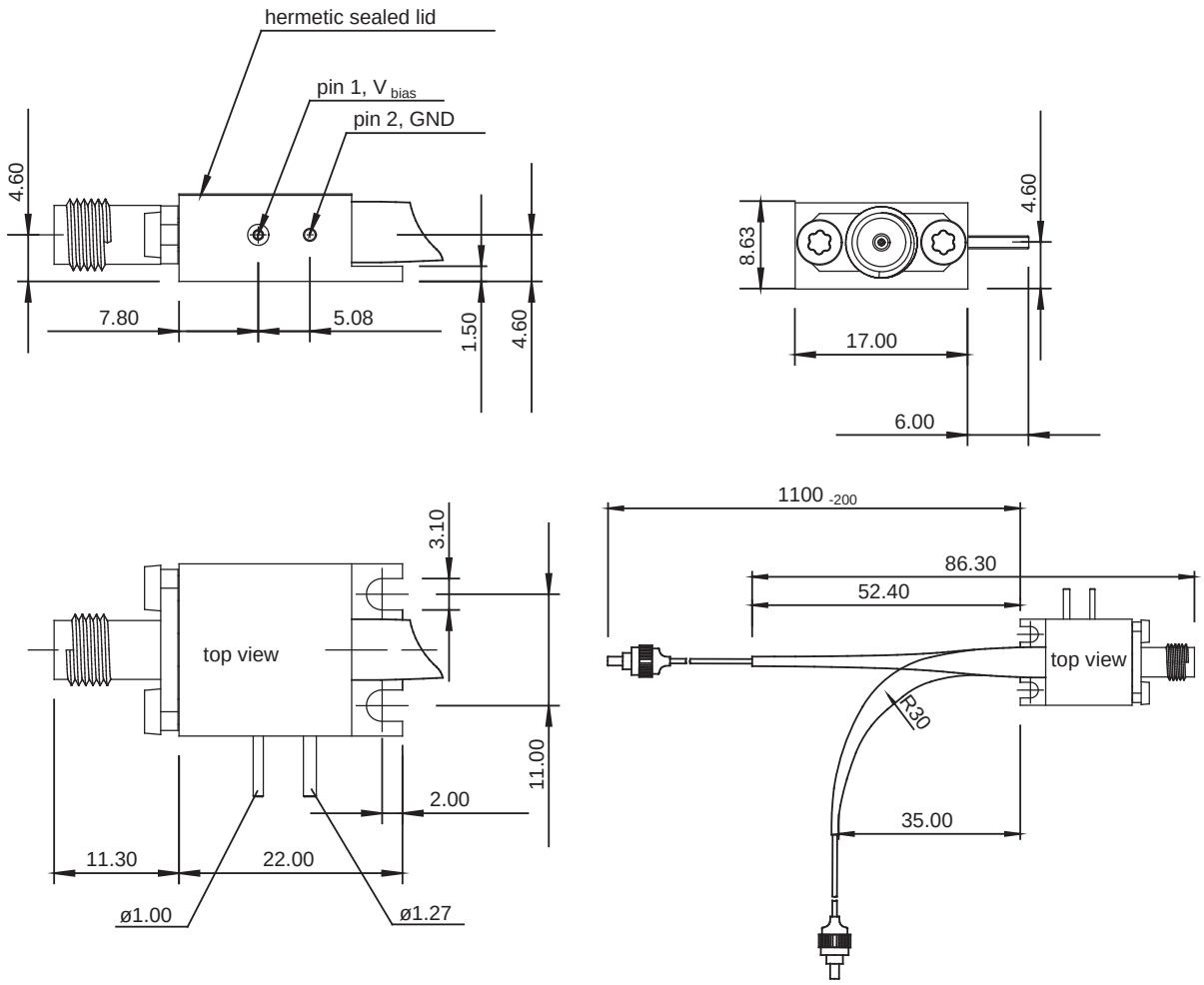
Block Diagram



Pin Description

Pin#	Symbol	Description
1	V_{bias}	bias supply, typ. 2.8 V
2	GND	Case ground

Mechanical Dimensions



All dimensions in mm.

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 photoreceiver.

XPDV 3120 [R] - [yy] - [zz]

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

specifies rf connector
VF = female V Connector® (standard)
VM = male V Connector®

specifies termination resistor
R = internal 50 Ω termination resistor, DC-coupled version

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.

V Connector® is a registered trademark of Anritsu Company.

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