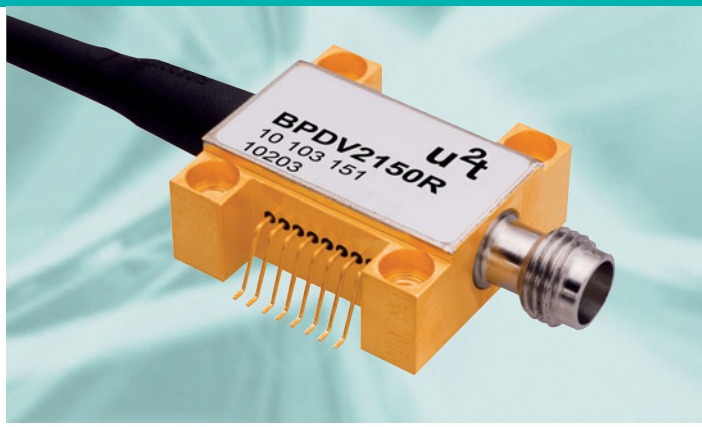
u2t photonics



Balanced Photodetector

Product Code: BPDV2xxxR

Product Description

The BPDV contains two waveguide-integrated photodetectors on a single chip connected as a balanced detector. This configuration ensures an excellent uniformity of the paired photodetectors. The waveguide approach guarantees a linear frequency response in power as well as in phase even at very high optical powers. The photodetector is biased via integrated biasing networks with one positive and one negative voltage. The integrated 50 Ω termination provides an excellent matching of the electrical output signal. Alternative configurations without termination resistors are available upon request.

Features

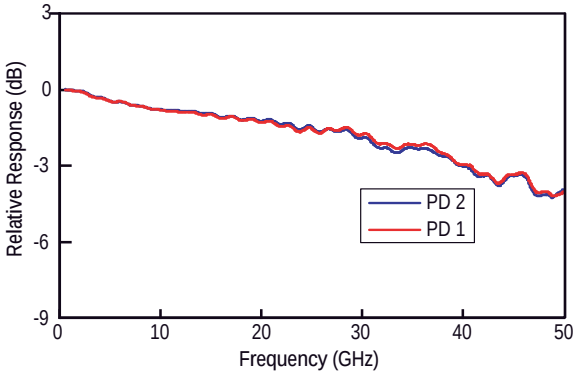
- Highest bandwidth with flat response
- High frequency response uniformity
- Excellent pulse behavior
- Unsurpassed high-power handling capability
- Low path length difference
- Integrated 50 Ω termination
- Unique on-chip integrated bias network

Applications

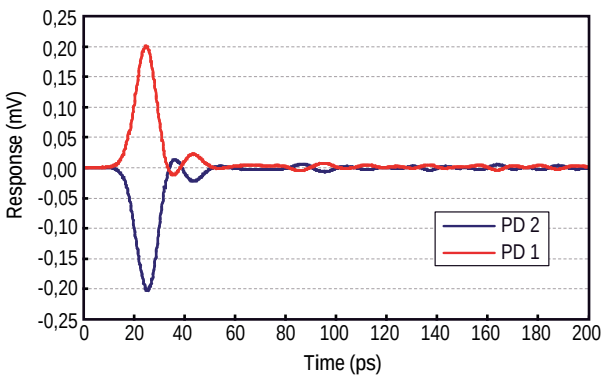
- 40/43 Gbit/s DQPSK optical communication systems
- High-speed coherent systems
- High speed optical sensors

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 PD1	V_{PD1}		0		+3.5	V
Photo diode reverse voltage PD2	V_{PD2}		0		-3.5	V
Maximum average optical input power	P_{opt}	NRZ, per channel			16	dBm
Maximum output peak voltage PD1	V_{Peak}				+1.5	V
Maximum output peak voltage PD2	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}	for each diode	-20		13	dBm
Photodiode reverse voltage	V_{PD}		2.0	2.8	3.3	V

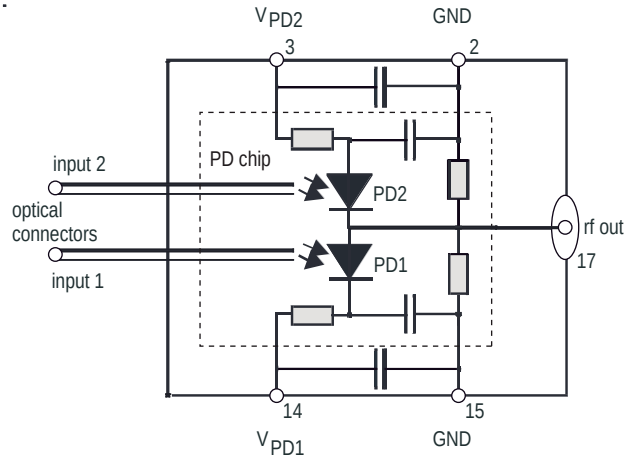
Optical and Electrical Specifications 1)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC responsivity @ 1550 nm	R	optimum polarization	0.5	0.6		A/W
Imbalance of responsivity	Δ R	2)		1.5	4.5	%
Polarization dependent loss BPDV2x20R BPDV2x50R	PDL			 0.4 0.2	 0.8 0.3	dB
Optical return loss	ORL	λ =1550 nm	27			dB
Pulse width		3)		11	12	ps
3dB cut-off frequency	f_{3dB}		37	42		GHz
Output reflection coefficient	S_{22}	0.05 - 50 GHz		-5	-3	dB
Photodiode dark current	I_{dark}	T_{case} = 25°C		5	200	nA
Skew BPDV20xxR BPDV21xxR					 5 2	ps
CMRR		4)		15		dB

Notes: 1) λ = 1550 nm, V_{bias} = ± 2.8 V, T = 25°C
2) Imbalance of responsivity = abs (R_{PD1} - R_{PD2}) / R_{PD1} + R_{PD2}) x 100%
3) Measured using Tektronix oscilloscope with 50 GHz sampling head
4) Imbalance set to zero; CMRR defined in the rf domain as note 2), but excluding influence of different delays between the two inputs

V Connector® is a registered trademark of Anritsu Company.

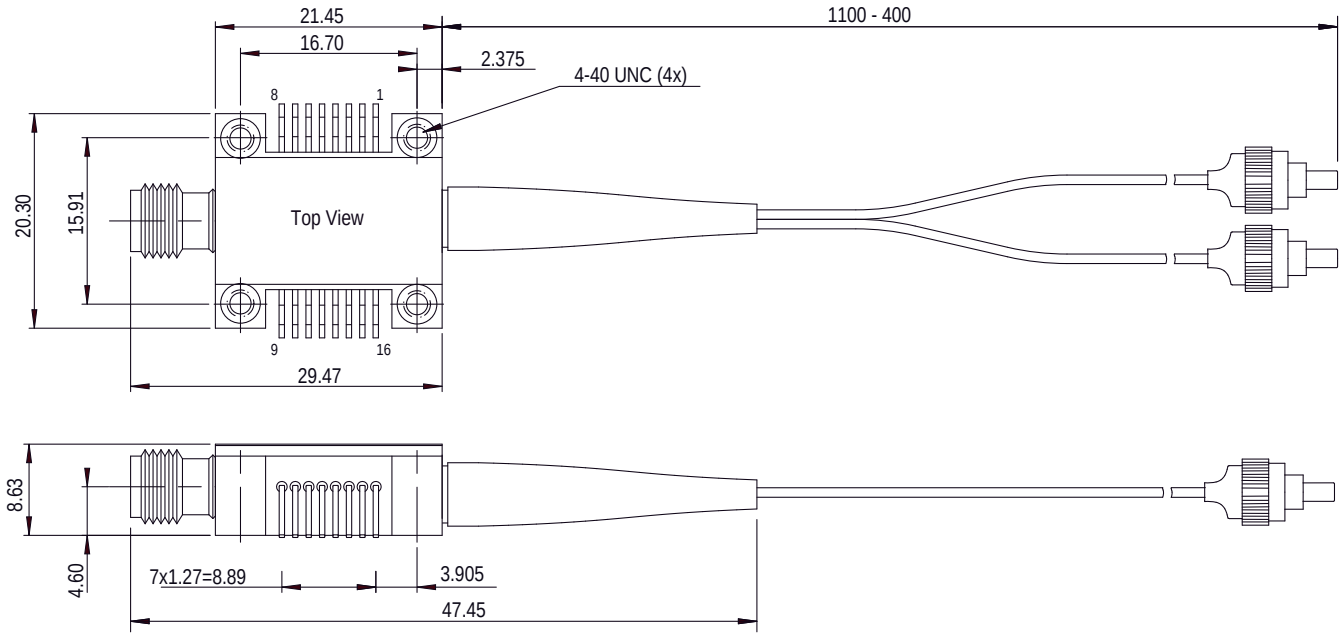
Block Diagram



Pin Description

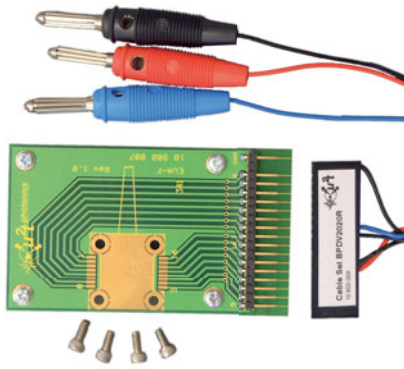
Pin#	Symbol	Description
3	V_{PD2}	PD2 Supply Input 2; typ. -2.8 V
2 / 15	GND	Ground = case ground
14	V_{PD1}	PD1 Supply Input 1; typ. +2.8 V
17	OUT	rf output V® connector

Mechanical Dimensions



All dimensions in mm.

Accessories



Evaluation Kit

The Evaluation Kit EVA-BPDV serves as easy-to-use utility to characterize the Balanced Photodetector BPDV2020R under laboratory conditions. The kit consists of a PCB (printed circuit board), a DC cable set and 4 socket head screws 4-40 UNC (see picture).

PPS-03-B

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

Ordering Information

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

BPDV[xxxx] 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®

product specification
available types:

2020 = standard version	2120 = Low skew version
2050 = Low PDL version	2150 = Low PDL and low skew version

PPS-03-[B]

specifies matching Balanced Photodetector type
B = BPDV2xxxR, consists of 2 PPS units and 1 cable-set B-type; BNC-to-banana plug, compatible with EVA-Kit

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

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