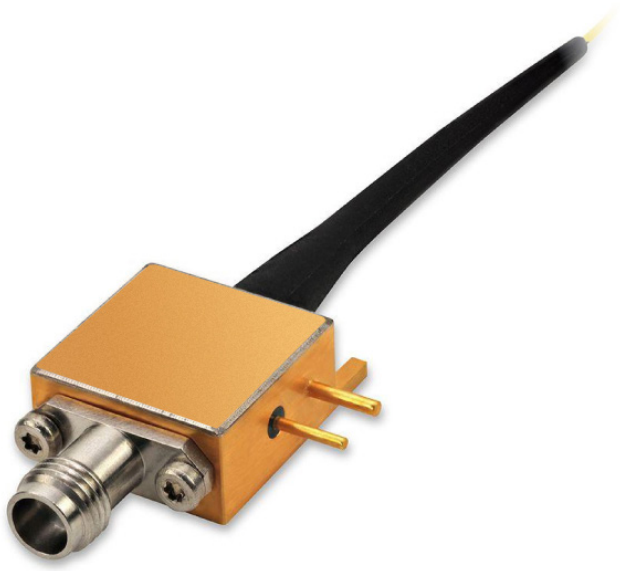
50 GHz DUAL-WINDOW PHOTODETECTOR

XPDV2320R

The XPDV2320R 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 optimized design ensures an undisturbed frequency response to the 3 dB cut-off frequency and saves costs for internal bias tees. The hermetic module is especially designed for both optical windows at 1310 nm and 1550 nm. Further advantage of the waveguide structure is the unbeatable RF high-power behavior. The photodetector shows a linear response up to an optical input power of 10 dBm, resulting in a high output voltage swing and avoiding the need for electrical amplification.



FEATURES

- 50 GHz typical electrical 3 dB bandwidth
- Excellent flat response
- Support of 1310 nm and 1550 nm
- Well-matched 50 Ω output
- Unique on-chip integrated bias network

APPLICATIONS

- Communication system at 40 Gbps
- High-speed Lightwave characterization
- Microwave photonics up to 60 GHz

COHERENT

Product Selection

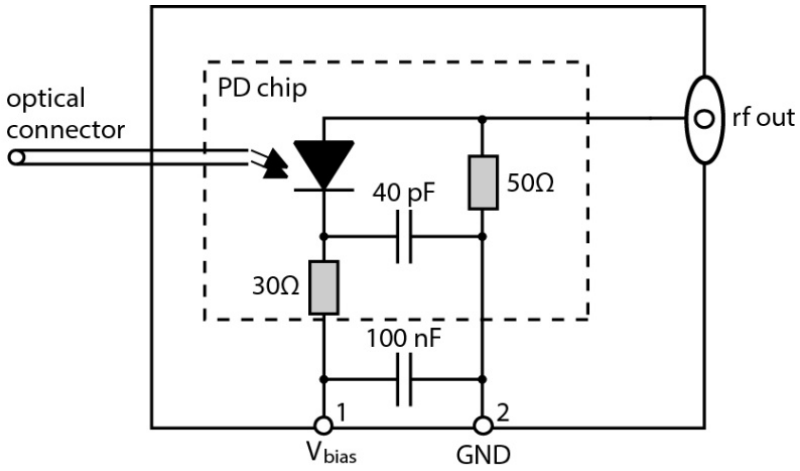
XPDV2320R-Vx-yy

Vx	F	= V-connector female (standard)
	M	= V-connector male
yy	FP	= FC/PC (standard) Available connectors: FA-FC/APC Other connectors available upon request

Pin Descriptions

# Pin	Symbol	Description
1	V_{bias}	PD bias supply
2	GND	Case ground

Block Diagram



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 datasheet. 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 40 Gbps NRZ			16	dBm
Maximum Peak Optical Input Power	P_{peak}	Pulse < 25 ps or 40 Gbps RZ			19	dBm
Electrostatic Discharge (ESD)	V_{ESD}	C = 100 pF, R = 1.5 kΩ HBM	-250		+250	V
Fiber Bend Radius			16			mm

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

Operating Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Operating Wavelength Range	λ		1300		1330	nm
			1525		1575	
Average Optical Input Power Range	P_{OPT}				10	dBm
Photodiode Bias Voltage	V_{bias}		2.0	2.8	3.3	V

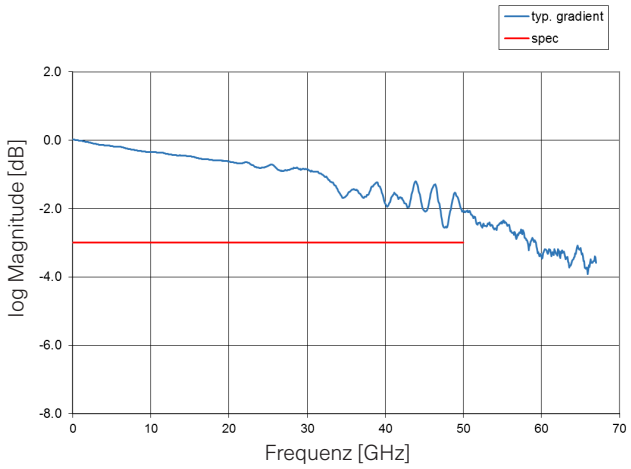
Electro-Optical Specifications [1]

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC Responsivity	R	1310 nm	0.30	0.45		A/W
		1550 nm	0.45	0.65		
Polarization-Dependent Loss	PDL	1310 nm		0.4	0.7	dB
		1550 nm		0.3	0.6	
Optical Return Loss 1	ORL	1550 nm	27			dB
3 dB Cut-off Frequency 2	f3dB		45	50		GHz
Output Reflection Coefficient	S22	0.05...50 GHz		-10	-8	dB
Photodiode Dark Current	Idark			5	200	nA
Output Voltage 3	V	50 Ω load Popt = 13 dBm		325		mV

Notes:
1. λ = 1550 nm or 1310 nm, V_{PD} = 3.3 V, T_{case} = 25 °C, optical input power -3 dBm.
2. Measured using Agilent 86030A 50 GHz Lightwave component analyzer.
3. Indicative value, for information only

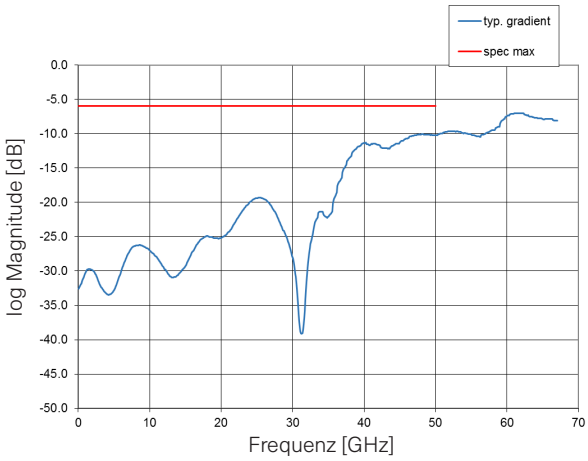
Typical Performance Behavior

O/E Bandwidth Log Magnitude Plot



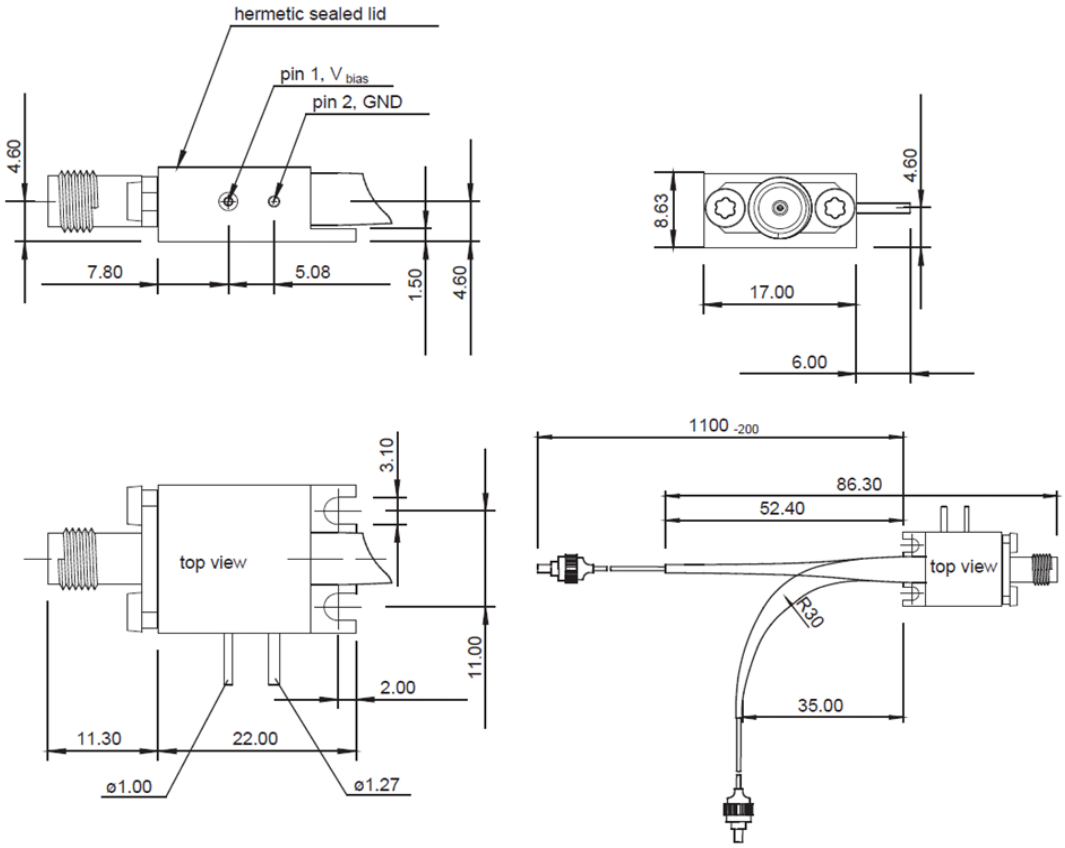
Typ.S21

S22 Log Magnitude Plot



Typ.S22

Mechanical Specifications



All dimensions in mm

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

Accessories

Usage of Coherent'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 a stable bias voltage supply and a front display for review of 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 1.5 V batteries and a BNC-to-female connector plug cable.





Notes

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