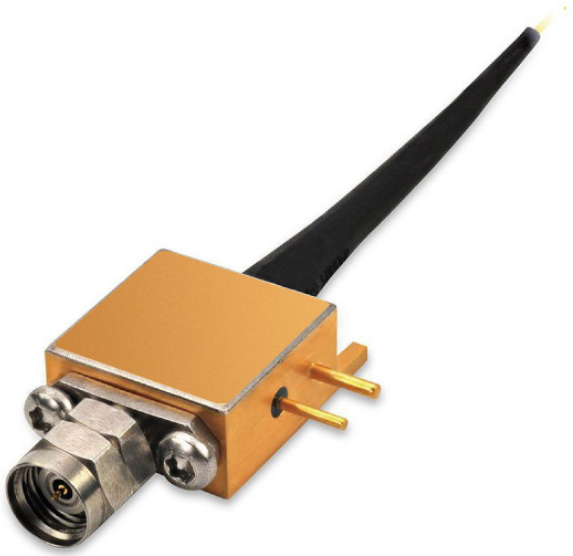
Optical Communications

50 GHz PHOTODETECTOR

XPDV21x0R(A)

Coherent's XPDV21x0R(A) 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 an optimized RF design ensures an undisturbed frequency response from DC to the 3 dB cut-off frequency and saves costs for internal bias tees. The hermetic 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 highpower 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 bandwidth with flat response
- High linearity
- Excellent pulse behavior
- Well-matched 50 Ω output
- Unique on-chip integrated bias network

APPLICATIONS

- Metro and long-haul transmission
- Datacenter interconnects

COHERENT

Product Selection

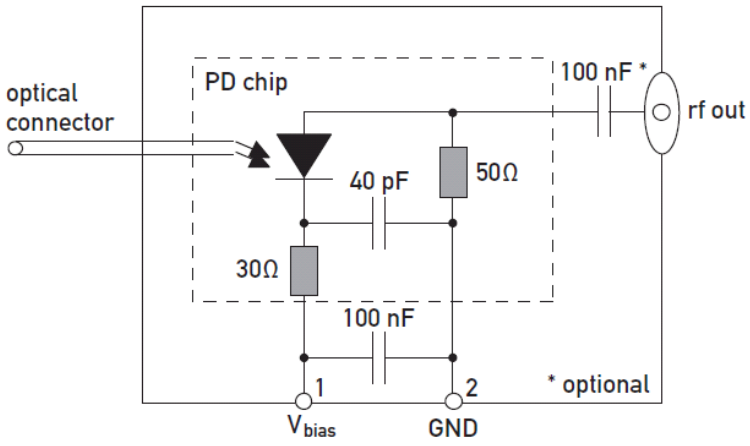
XPDV21x0Rv-Vy-zz

x	2	= standard PDL
	5	= low PDL, not an AC-coupled version
v	A	= AC-coupled, not available for 2150
Vy	VF	= female V-connector (standard)
	VM	= male V-connector
zz	FP	= FC/PC connector (standard) Other available choices are: FA-FC/APC Customized configurations 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
Average Optical Input Power Range	P_{OPT}				10	dBm
Operating Wavelength Range	λ		1525		1575	nm
Photodiode Bias Voltage	V_{bias}		2.0	2.8	3.3	V

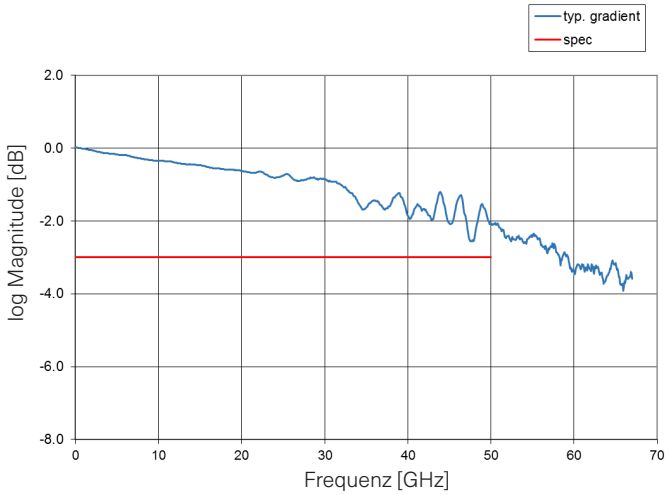
Electro-Optical Specifications [1]

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode DC Responsivity	R	Optimum polarization	0.5	0.65		A/W
Polarization-Dependent Loss	PDL	XPDV2120R(A)		0.3	0.6	dB
		XPDV2150R		0.1	0.3	dB
Photodiode Dark Current	I_{dark}			5	200	nA
Optical Return Loss	ORL		27			dB
3 dB Cut-off Frequency [2]	f_{3dB}	XPDV21x0R	45	50		GHz
		XPDV2120RA	32	40		
Output Reflection Coefficient [3]	S_{22}	XPDV21x0R		-10	-6	dB
		XPDV2120RA		-8		
Output Voltage [4]	V	50 Ω load P_{opt} = 13 dBm		325	2	mV

Notes:
1. λ = 1550 nm, V_{PD} = 3.3 V, T = 25 °C, P_{OPT} = -3 dBm.
2. Measured using Agilent N4373D 67 GHz Lightwave component analyzer.
3. 0.05 to 50 GHz.
4. Indicative value, for information only.

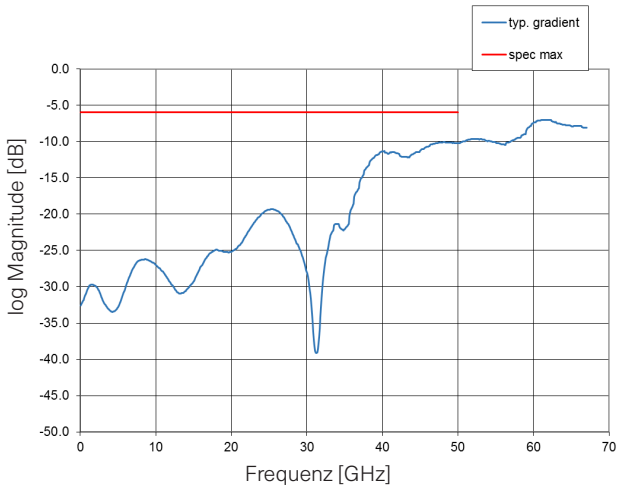
Typical Performance Behavior

O/E Bandwidth Log Magnitude Plot



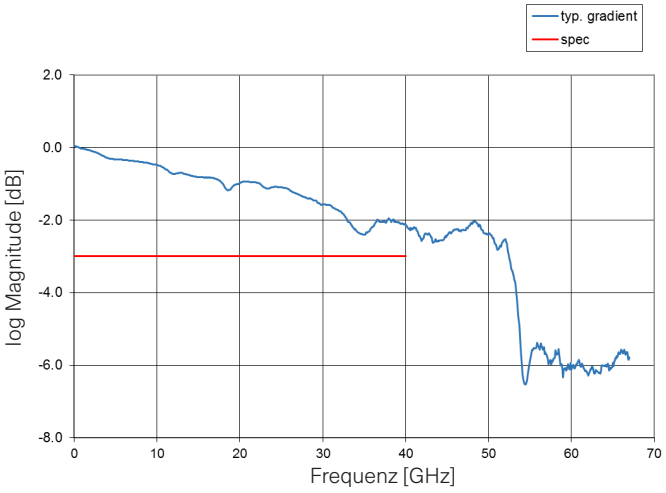
Typ. S21 XPDV 21x0R

S22 Log Magnitude Plot



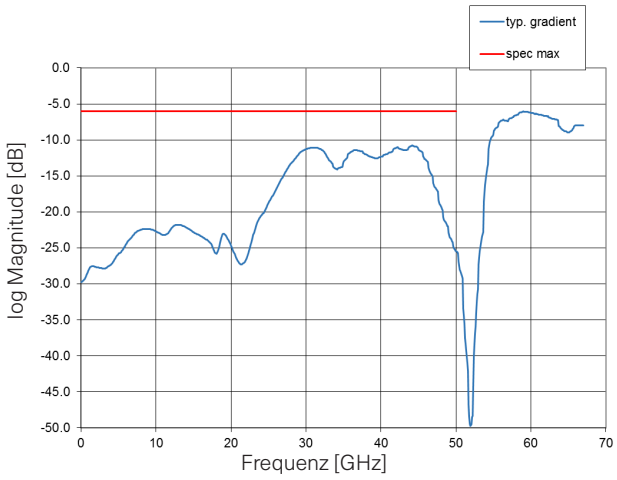
Typ S22 XPDV 21x0R

O/E Bandwidth Log Magnitude Plot



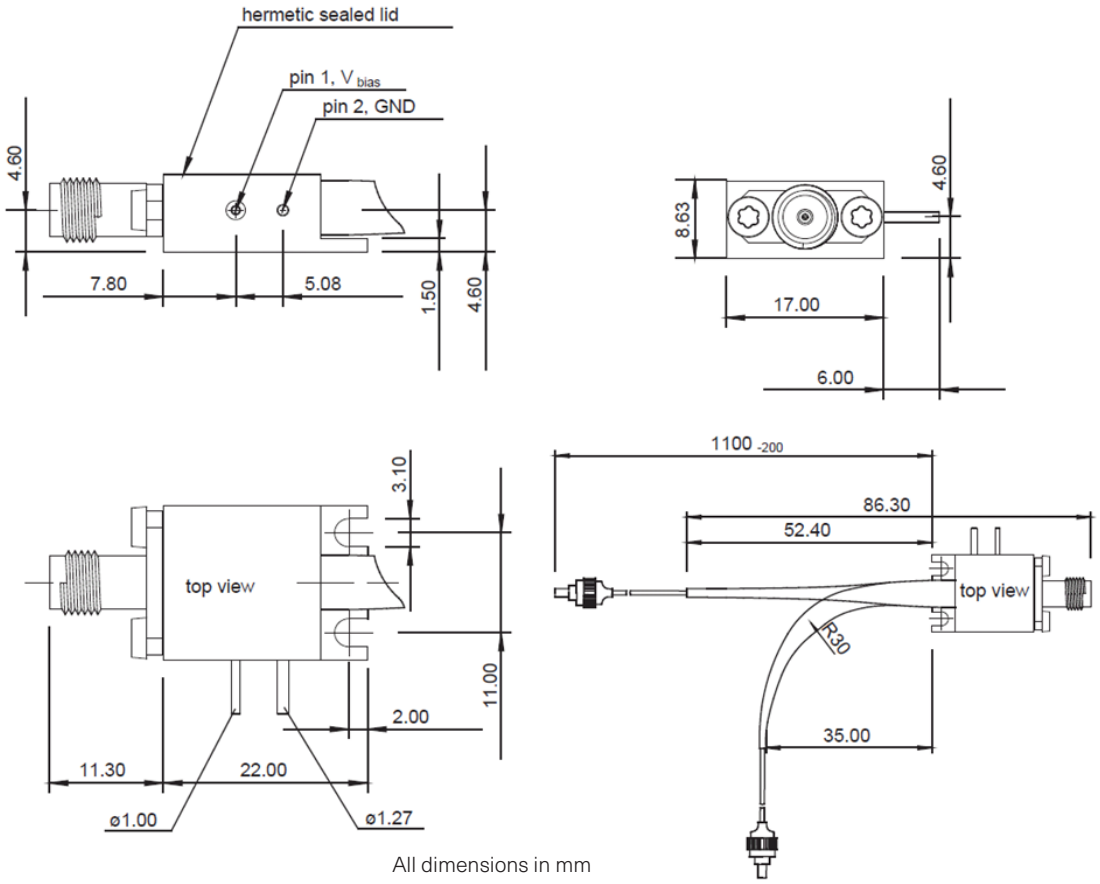
Typ. S21 XPDV 2120R(A)

S22 Log Magnitude Plot



Typ S22 XPDV 21x0R(A)

Mechanical Specifications



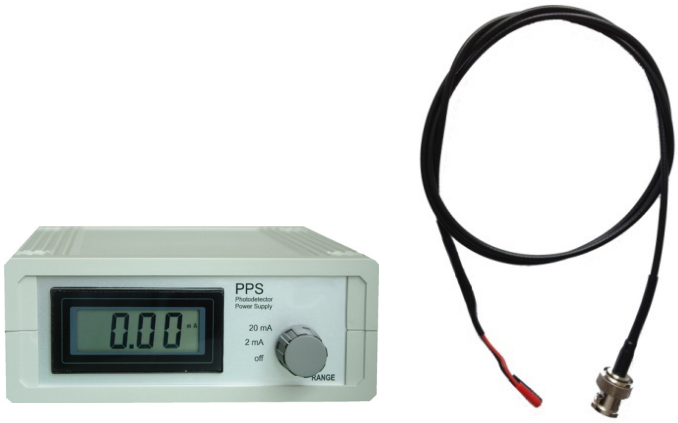
All dimensions in mm

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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