

## Product Specification

### 43 Gb/s High Gain Photoreceiver

#### XPRV2022A

#### PRODUCT FEATURES

- PIN / TIA photoreceiver module
- 33 GHz bandwidth
- 500 V/W conversion gain
- SMD package with V<sup>®</sup> connector
- AC coupled output

#### APPLICATIONS

- 43 Gb/s communication systems (OC-768)
- Transponder and line card designs
- Laboratory test equipment



The photoreceiver module XPRV2022(A) is a single ended front-end with a high gain of typically 500 V/W and a bandwidth of 33 GHz. The photoreceiver module XPRV2022(A) contains a waveguide-integrated PIN-photodiode (PD) and a transimpedance amplifier (TIA) with limiting output buffer. An integrated feedback loop optimizes the performance in the frequency and/or time domain with respect to different optical input power. Due to the limiting output buffer the output voltage swing is limited to approx. 400 mV. Incorporated blocking capacitors enable AC output coupling.

#### ORDERING INFORMATION

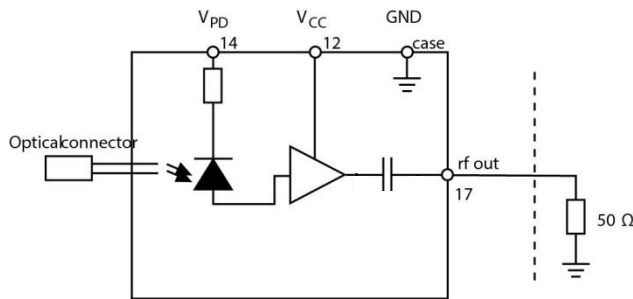
##### XPRV2022A-VV-zz

A:		= AC coupled
Vy:	VF	= female V Connector <sup>®</sup> (standard)
	VM	= male V Connector <sup>®</sup>
zz:	FP	= FC/PC (standard)
		other connectors available upon request

## I. Pin Description

# Pin	Symbol	Description
1,3,16	N/C	not connected, 100 nF to GND, max +5 V
2,4,5,6,11,13,15	GND	ground
7,8,9,10	RFU	reserved for future use - please do not connect
12	$V_{CC}$	amplifier supply
14	$V_{PD}$	photodiode supply
17	out	inverting RF output, $V^{\circledR}$ connector

## II. Block Diagram



## III. Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photodiode Reverse Voltage	$V_{PD}$	$V_{CC} = \text{Min to Max}$	2		4	V
Amplifier Supply Voltage	$V_{CC}$	$V_{PD} = 2 \text{ V to Max}$	0		4	V
Maximum Average Optical Input Power	$P_{opt}$	NRZ			6	dBm
Electro Static Discharge	$V_{ESD}$	$C = 100 \text{ pF}, R = 1.5 \text{ k}\Omega \text{ HBM}$	-250		250	V
Fiber Bend Radius			16			mm



### Notice

Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operations section for extended periods of time may affect reliability.

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation to equipment, take normal ESD precautions when handling this product.

#### IV. Environmental Conditions

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

#### V. Operating Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Amplifier Supply Voltage	$V_{CC}$		3.1	3.3	3.5	V
Operating Wavelength Range	$\lambda$		1480		1620	nm
Average Optical Input Power Range	$P_{opt}$		-10		3	dBm
Photodiode Reverse Voltage	$V_{PD}$		3.1	3.3	3.5	V

#### VI. Electro-Optical Specifications<sup>1</sup>

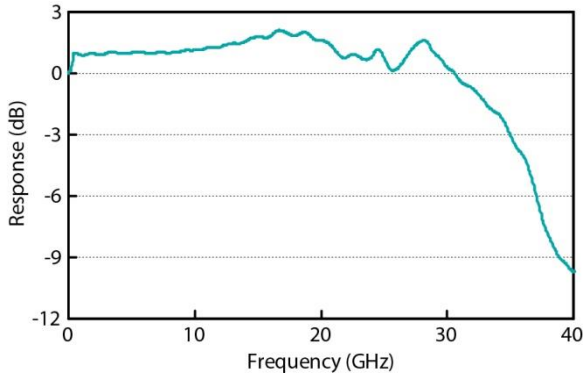
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Conversion Gain	CG	<sup>2)</sup>	300	500		V/W
Photodiode DC Responsivity	R	optimum polarization	0.5		0.75	A/W
Polarization Dependent Loss	PDL			0.3	0.9	dB
Optical Return Loss	ORL		27			dB
3dB Cut-off Frequency	$f_{3dB}$	<sup>2)</sup>	30	30		GHz
Lower Frequency cut off	$f_{3dB\_L}$				100	kHz
Output Reflection Coefficient	$S_{22}$	0.5 - 15 GHz		-15	-10	dB
		15 - 30 GHz		-6	-2	
Output Voltage Swing	$V_{out}$	$P_{opt} \geq 0$ dBm		400	600	mV
Equivalent Input Noise Density	$i_{noise}$				40	pA/ $\sqrt{Hz}$
Overload	$P_{overl}$	<sup>3)</sup>	3			dBm
Photodiode Dark Current	$I_{dark}$	$T_{Case} = 25$ °C		8	200	nA
Power Consumption	$P_{con}$	$V_{CC} = max$			0.4	W

Notes:

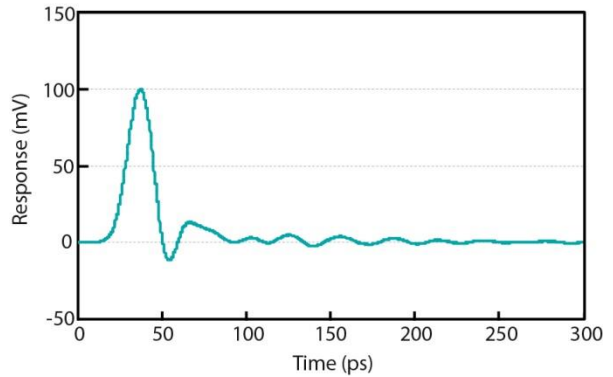
- $\lambda = 1550$  nm,  $V_{bias} = 3.3$  V,  $T = 25$  °C
- Measured using Agilent 860330A 50 GHz Lightwave component analyzer
- Evaluated from NRZ eye diagram and BER measurement at 40 Gb/s (BER  $10^{-12}$ , PRBS  $2^{31}-1$ , back to back)

## VII. Typical Performance Curves

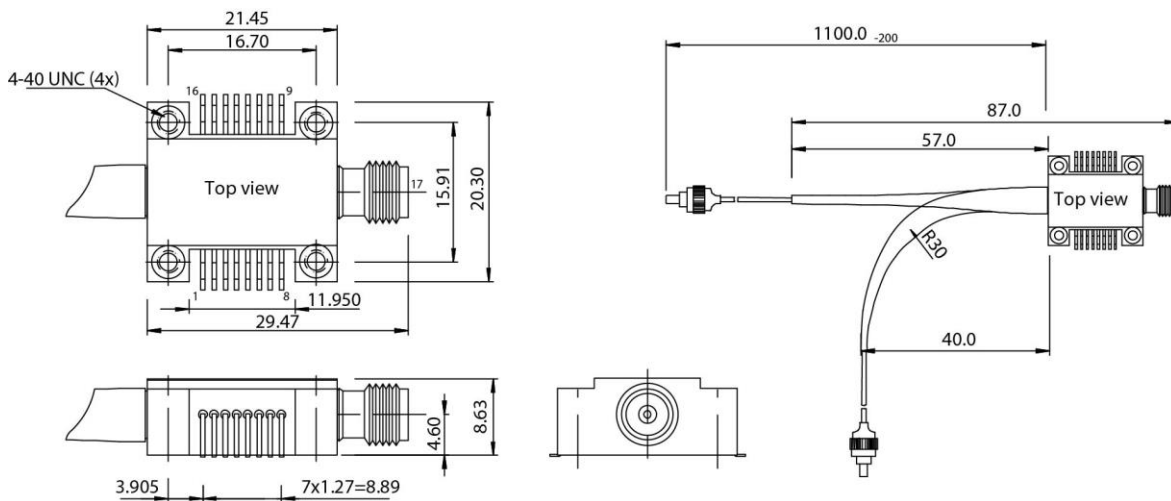
Frequency Response



Pulse Response



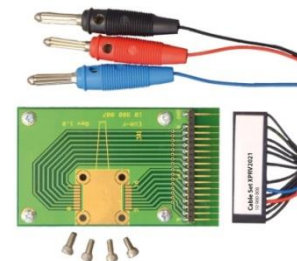
## VIII. Mechanical Specifications



All dimensions in mm.

## IX. Accessories

The Finisar Evaluation Kit EVA-XPRV serves as an easy-to-use utility to characterize the Finisar photoreceiver XPRV2022A under laboratory conditions. The kit consists of a PCB (printed circuit board), a DC cable set and 4 socket head screws 4-40 UNC.



## ORDERING INFORMATION

**EVA – XPRV**

**X. Revision History**

Revision	Date	Description
A1	04/09/2014	Document created.
A2	05/18/2017	Updated version with new Finisar Logo Modified block diagram and removed DC coupled version (EOL'd)

**Notes**

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