

Preliminary - Product Specification

30GHz Linear Dual Window Photoreceiver

XPRV2325A

PRODUCT FEATURES

- Linear PIN/TIA photoreceiver module
- 31 GHz typical bandwidth
- Mode Select and optional I²C interface
- Adjustable conversion gain, output swing
- RF output disable
- SMD package with V[®] connector
- AC coupled output
- 1310 and 1550 nm wavelength

APPLICATIONS

- 56 GBaud PAM4 communication systems
- Transponder and line card designs
- Laboratory test equipment



The photoreceiver module XPRV2325A is a single ended optical front end with a very flexible design. The package contains a dual-wavelength, waveguide-integrated PIN photodiode (PD) and a transimpedance amplifier (TIA) that can optionally be controlled via an I²C interface. The amplifier has a typical bandwidth of 31 GHz, is optimized for linearity and for low noise and exhibits a manual (MGC) as well as an automatic gain control (AGC) mode. Depending on the settings, the conversion gain can be varied from 25 to 1800 V/W (MGC mode) or the output amplitude can be varied from 0 to 300 mV peak-peak (AGC mode). An integrated feedback loop optimizes the performance in the frequency and/or time domain with respect to different optical input powers. An integrated blocking capacitor enables AC output coupling.

PRODUCT SELECTION

XPRV2325A-	VF-zz	
VF: zz:	FC	= V-connector, female = FC/PC connector (standard) Alternative options upon request



I. Pin Descriptions

Pin Number	Symbol	Description		
1,2,8,9,10,16	N/C	C Not connected, recommended to set to ground		
3,11,13,15	GND	Ground		
4	MS	Mode Select		
5	ADJ	AGC mode: Output amplitude adjust, MGC mode: Gain adjust		
6	SDA	I ² C interface-Data line		
7	SCL	I ² C interface-Clock line		
12	V _{cc}	Amplifier supply		
14	V _{PD}	Photodiode supply		
17	out	Inverting RF output		

II. Block Diagram





III. 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 data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Condition	Min.	Max.	Unit
Photodiado Povorso Voltago	V	Refer to power up sequence	0	4	V
Photodiode Reverse voltage	V PD	in Manual	0	-	v
Amplifier Supply Voltage	V _{cc}	V_{PD} = 1.5V to Max	0	4	V
Serial Bus Data (SDA)	V_{SDA}		0	V_{cc}	V
Serial Bus Clock (SCL)	V _{SCL}		0	V_{cc}	V
Maximum Optical Input Power	P _{opt}	CW or 40GB/s NRZ		8	dBm
Electro Static Discharge	V_{ESD}	C= 100pF, R= 1.5kΩ HBM	-250	250	V
Fiber Bend Radius			16		mm

IV. Environmental Specifications

Parameter	Symbol	Condition	Min.	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.	Тур.	Max.	Unit
Amplifier Supply Voltage	V _{cc}	V _{PD} >= 1.5V	3.1	3.3	3.5	V
Operating Wayslangth Banga	λ		1300	1310	1330	nm
Operating wavelength Kange			1525	1550	1575	nm
Average Optical Input Power	D				2	dPm
Range	Fopt	CW OF 40GB/S NRZ			5	UDIII
Photodiode Reverse Voltage	V _{PD}		3.1	3.3	3.5	V
Output Amplitude Setting	Van		0		27	v
(ADJ-analog input)	V ADJ		0		2.7	v
Modes Select (MS-digital input)	V _{MS}		0		open	V



VI. Electro-Optical Specifications¹

Parameter	Symbol	Condition	Min.	Тур.	Max.	Unit
		1310nm, Depending on	525	800	1100	1/1/1
Conversion Gain		optical input power				v/ vv
	CG	1550nm, Depending on	075	1375	1875	
		optical input power	075			v/ vv
Photodiode DC Responsivity	P	1310nm	0.3	0.45		A/W
,		1550nm	0.5	0.65	0.75	A/W
Polarization Donondont Loss	וחמ	1310nm		0.4	0.7	dB
	FDL	1550nm		0.3	0.9	dB
Optical Return Loss	ORL		27			dB
3dB Cut-off Frequency ³⁾	f _{3dB}	MGC Mode, gain=100D	29	31		GHz
Lower Frequency cut off	f _{3dB_L}				200	kHz
Output Deflection Coefficient	S ₂₂	0.5 - 15GHz		-15	-10	dB
Output Reflection Coefficient		15 - 50GHz		-10	-5	
Output Voltage Swing	V_{out}	max gain			350	mV
Equivalent Input Neise Density	I _{noise}			20		pA/
		maximum gain		20		√Hz
Total Harmonic Distortion	THD	114 GHz, V _{out} < 0.2 Vpp, I _{in} < 2.2 mApp		3		%
Photodiode Dark Current	l _{dark}			8	200	nA
Power Consumption	P _{con}			0.18		W
Notes: 1. $\lambda = 1310/1550 \text{ nm}, \text{ V}_{\text{CC}} = \text{V}_{\text{PD}} = 3.320 \text{ Notes}$	8 V, T = 25 °C			1	1	

2. For information only, not tested in production

3. Measured using Agilent 860330A 50 GHz Lightwave component analyzer



VII. Typical Performance Behavior



VIII. Mechanical Specifications

All Dimensions in mm



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



Notes

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- II-VI Incorporated reserves the right to make changes without notice.

IX. Revision History

Revision	Date	Description
A00	2020-09-20	Initial draft
A02	2021-09-02	Addition of O-band, added parameters, pinout adjustment for Mode
		Select, editorial changes
A03	2022-02-17	editorial changes