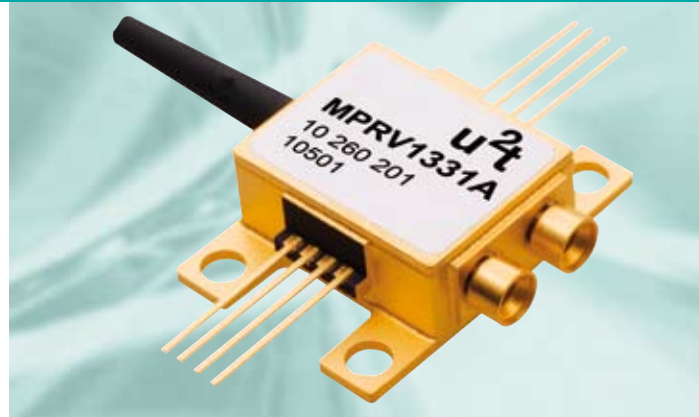


## 43 Gbit/s High Gain Differential Photoreceiver

Product Code: MPRV1331A



### Product Description

The MPRV1331A is a differential photoreceiver module with very high differential conversion gain of typ. 2100 V/W and a bandwidth of 31 GHz. The photoreceiver module MPRV1331A 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 differential output voltage swing is limited to 700 mV. Incorporated blocking capacitors enable AC output coupling.

### Features

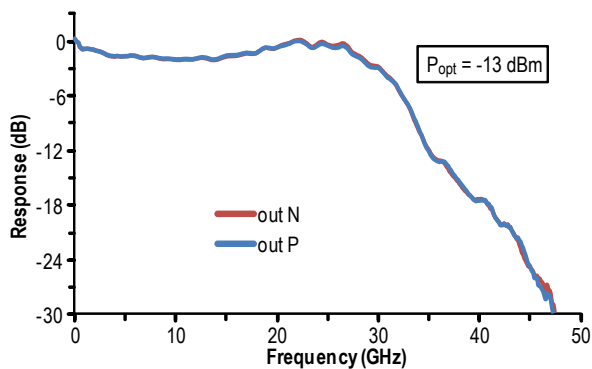
- XLMD MSA footprint compliant package
- PIN / TIA photoreceiver module
- 31 GHz bandwidth
- 2100 V/W conversion gain@1550nm
- Differential AC coupled output

### Applications

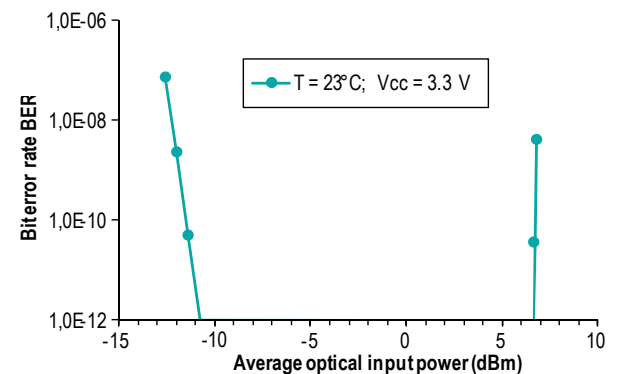
- 43 Gbit/s communication systems (OC-768)
- Transponder and line card designs

### Typical Performance

#### Frequency Response



#### BER Performance @ 1550 nm



## Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Storage temperature	$T_{stg}$	non condensing	-40		+85	°C
Photodiode bias 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			10			mm

## Operation Conditions

Parameter	Symbol	Condition	Min.	Typ. 1)	Max.	Unit
Operating case temperature range	$T_{case}$		0	+20	+75	°C
Relative humidity range	RH	Non condensing	5		85	%
Operating wavelength range	$\lambda_1$ $\lambda_2$		1300 1530	1310 1550	1330 1620	nm
Average optical input power	$P_{opt}$			-3	3	dBm
Photodiode bias voltage	$V_{PD}$		3.135	3.3	3.465	V
Amplifier supply voltage	$V_{CC}$		3.135	3.3	3.465	V

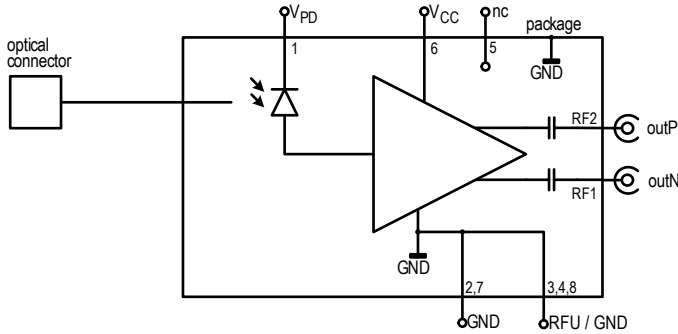
## Optical and Electrical Specifications

Parameter	Symbol	Condition	Min.	Typ. 1)	Max.	Unit
Differential conversion gain @ $\lambda_2$	CG	2), 3)	1700	2100		V/W
Differential conversion gain @ $\lambda_1$			1100	1600		
Photodiode DC responsivity @ $\lambda_2$	R	optimum polarization	0.4	0.6		A/W
Photodiode DC responsivity @ $\lambda_1$			0.34	0.45		
Polarization dependent loss	PDL			0.3	0.9	dB
Optical return loss	ORL		27	30		dB
3dB cut-off frequency	$f_{3dB}$	3)	26	31		GHz
Lower frequency cut off	$f_{3dB\_L}$				100	kHz
Output reflection coefficient	$S_{22}$	0.5 - 15 GHz 15 - 50 GHz		-17 -5	-10 -2	dB
Differential output voltage swing	$V_{out\_diff}$	$P_{opt} \geq 0 \text{ dBm}$		500	700	mV
Equivalent input noise density	$i_{noise}$			17		pA/ $\sqrt{\text{Hz}}$
Sensitivity @ 1550 nm	Sens	4)		-10	-8	dBm
Sensitivity @ 1310 nm				-7	-5	
Overload	$P_{overl}$	4)	4	6		dBm
Photodiode dark current	$I_{dark}$			10	1000	nA
Power consumption	$P_{con}$	$V_{CC} = \text{max}$		0.4	0.5	W

Notes: 1) Typical optical and electrical specifications refer to typical operation conditions  
3) Measured using Agilent 860330A 50GHz Lightwave component analyzer

2) Measurements performed in single ended conditions  
4) Evaluated from NRZ eye diagram and BER measurement at 40Gbit/s (BER  $\leq 10^{-12}$ , PRBS  $2^{31}-1$ , back to back)

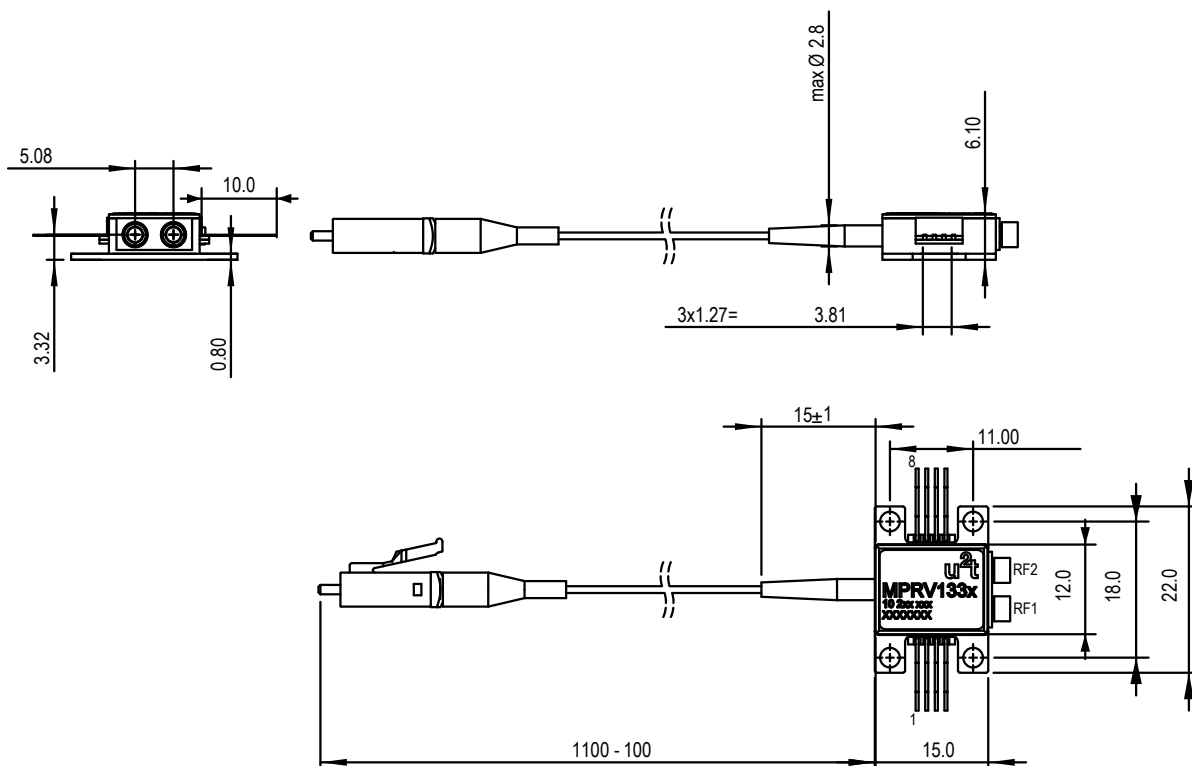
### Block Diagram



### Pin Description

Pin#	Symbol	Description
1	V <sub>PD</sub>	Photodiode supply
2,7	GND	Ground
3,4,8	RFU	Reserved for future use - please do not connect, internally connected to ground
5	NC	Reserved for future use - not connected
6	V <sub>CC</sub>	Amplifier supply
RF1	outN	Negative rf output
RF2	outP	Positive rf output

### Mechanical Dimensions



All dimensions in mm.

RF1, RF2 GPPOT<sup>™</sup> compatible connector

## Ordering Information

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

MPRV1331A - GM - **LP**

specifies optical connector  
LP = LC / PC (standard)  
other connectors available upon request

GPPO™ is a registered trademark of Corning Gilbert Inc.  
All specifications are subject to change without notice.

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