

## Product Specification

---

### 43 Gb/s Balanced Photoreceiver

---

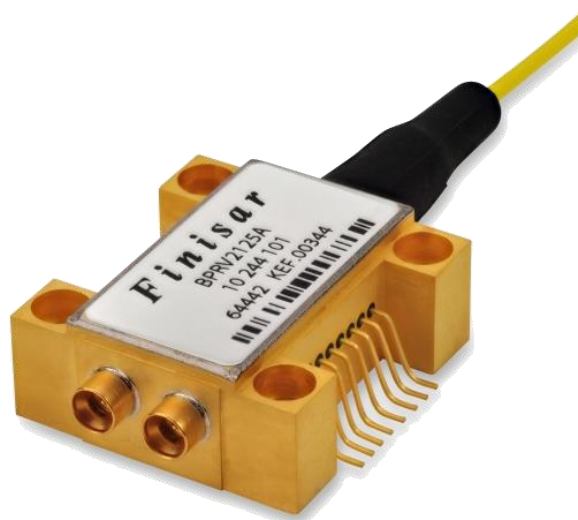
#### BPRV2125(A)

#### PRODUCT FEATURES

- Balanced receiver for DPSK
- Dual optical input – Differential RF output
- DC- or AC coupled
- Threshold control option
- Hermetically sealed SMD package

#### APPLICATIONS

- 43 Gb/s communication systems
- Transponder and line card designs



The balanced receiver module BPRV2125(A) is a differential front-end for 43 Gbit/s DPSK-applications featuring high differential gain of typically 2800 V/W and is available as AC- or DC-coupled variant. The photoreceiver contains two waveguide-integrated pin-photodiodes (PD) on a single chip and a limiting amplifier (LA) within one small form factor SMD-package. The limiting amplifier provides a differential output voltage swing of typ. 600 mV. The receiver is well suited for DPSK and DQPSK applications at 40G and 100G with rates between 20 and 43 GBaud.

#### ORDERING INFORMATION

<b>BPRV2125(A)-GM-zz</b>
--------------------------

zz                      = LP (LC/PC) standard optical connector  
                            = FA (FC/APC)

GM                     = male GPPO™ connector

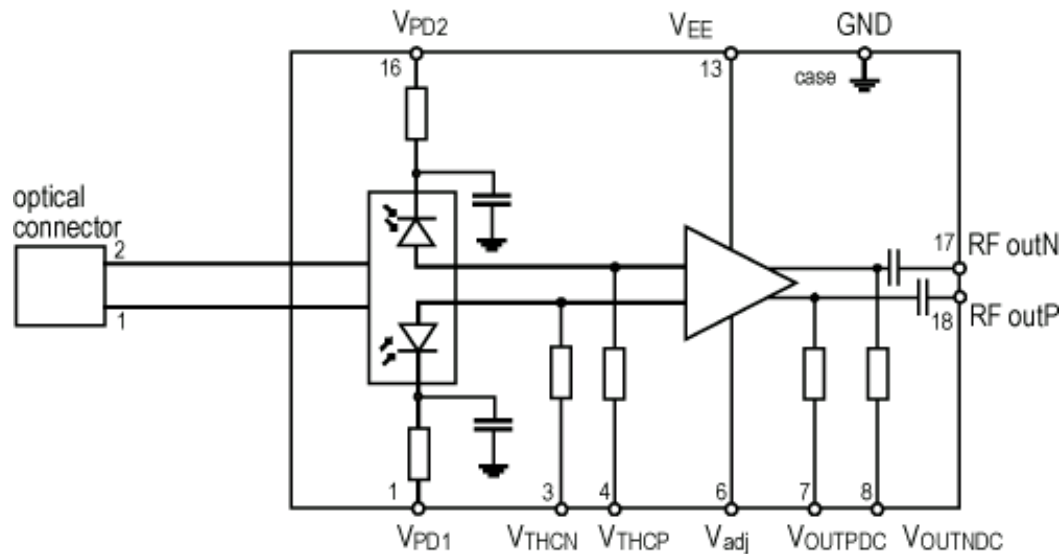
A                        = AC coupled version  
                            = blank (DC coupled version)

For evaluation kit please use the following code: EVA – BPRV

## I. Pin Description

Pin #	Symbol	Description
1	$V_{PD1}$	Photodiode 1 supply
3	$V_{THCN}$	Amplifier threshold control negative
4	$V_{THCP}$	Amplifier threshold control positive
6	$V_{ADJ}$	Amplifier adjustment control
7	$V_{OUTNDC}$	DC voltage monitor on outN
8	$V_{OUTPDC}$	DC voltage monitor on outP
9, 10, 11, 12	NC	not connected
13	$V_{EE}$	Amplifier supply voltage
2, 5, 14, 15	GND	Ground
16	$V_{PD2}$	Photodiode 2 supply
17	outN	RF output negative
18	outP	RF output positive

## II. Block Diagram



### III. Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Storage temperature	$T_{stg}$	Non condensing	-40		+85	°C
Photodiode bias voltage	$V_{PD1}, V_{PD2}$		0		+3.5	V
Amplifier supply voltage	$V_{EE}$		-5.5		+0.3	V
Amplifier adjustment voltage	$V_{ADJ}$		-5.5		+0.3	V
Amplifier threshold control voltage	$V_{THCP, N}$		-5.0		+5.0	V
Average optical input power	$P_{OPT}$	NRZ, per input port			+9	dBm
Electro-static discharge	$V_{ESD}$	C=100pF, R=1.5kΩ HBM	-500		500	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. Operating Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Case temperature	$T_{CASE}$		0		+75	°C
Relative humidity	RH	Non condensing	5		85	%
Wavelength range	$\lambda$		1530		1620	nm
Average optical input power	$P_{OPT}$	NRZ, per input port	-10		4	dBm
Photodiode bias voltage	$V_{PD1}, V_{PD2}$		+2.0	+2.25	+2.75	V
Amplifier supply voltage	$V_{EE}$		-5.5	-5.2	-4.8	V

## V. Electro-Optical Specifications <sup>1)</sup>

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Differential conversion gain	CG	<sup>2), 3)</sup>	2000	2800		V/W
Photodiode DC responsivity	R	optimum polarization	0.5	0.6	0.75	A/W
Polarization dependent loss	PDL			0.4	0.6	dB
Optical return loss	ORL		27	30		dB
Bit rate		NRZ, DPSK		43		Gbit/s
3dB cut-off frequency	$f_{3dB}$	<sup>3)</sup>	27	31		GHz
Lower frequency cut-off	$f_{3dB,L}$				100	kHz
Electrical output reflection coefficient	S22	$f = 0.5$ to $15$ GHz <sup>3)</sup> $f = 15$ to $50$ GHz <sup>3)</sup>			-10 0	dB
Differential output voltage swing	$V_{out,diff}$	$P_{opt} \geq 0$ dBm <sup>2)</sup> negative CML		580		mV
Skew				1	2	ps
Equivalent input noise density	$i_{noise}$				80	pA/ $\sqrt{Hz}$
Sensitivity	Sens	<sup>2), 4)</sup>		-10		dBm
Amplifier supply current	$I_{EE}$			85	100	mA
Photodiode dark current	$I_{dark}$	per PD		5	300	nA
Total power consumption	$P_{con}$			0.45	0.6	W

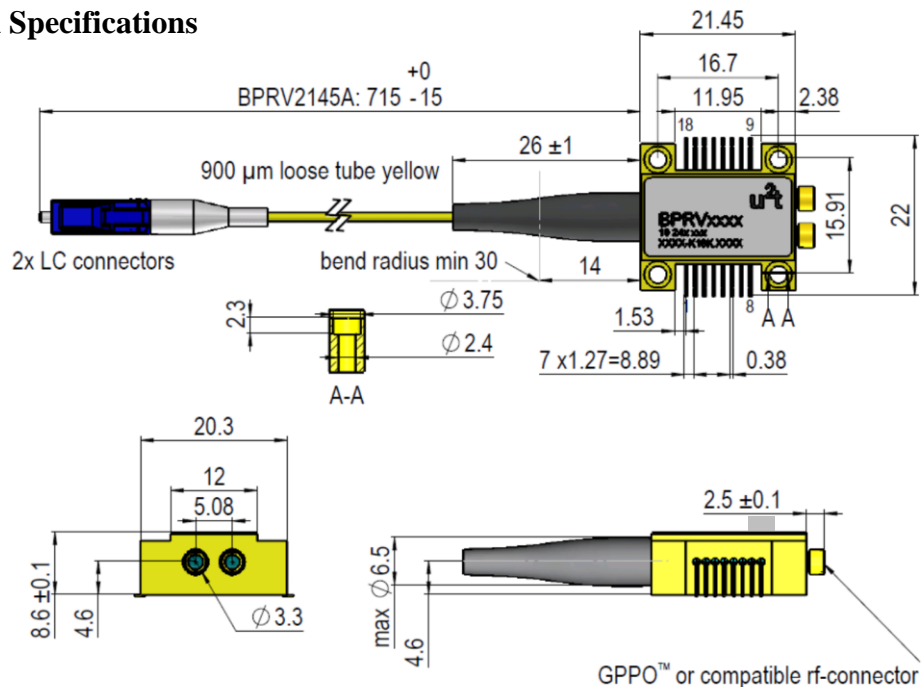
1)  $V_{PD1} = V_{PD2} = 2.25$  V,  $V_{EE} = -5.2$  V,  $V_{ADJ} = -2.4$  V,  $\lambda = 1550$  nm,  $T_{case} = 25$  °C.

2) Measurements performed in single ended conditions

3) Measurement with an Agilent 50GHz Lightwave component analyzer

4) Evaluated from NRZ BER measurements at 40 Gbit/s (BER $\leq 10^{-12}$ , PRBS 2<sup>31</sup>-1, back to back, DPSK)

## VI. Mechanical Specifications



All dimensions in mm.

## VII. Revision History

Revision	Date	Description
A1	04/09/2014	• Document created
A2	06/02/2015	• Update on optical connector
A3	04/29/2015	• new logo, corrected parameters

## Notes

- Any trademarks used in this document are properties of their respective owners.
- Finisar Corporation reserves the right to make changes without notice.

## For More Information

Finisar Corporation  
1389 Moffett Park Drive  
Sunnyvale, CA 94089-1133  
Tel. 1-408-548-1000  
Fax 1-408-541-6138  
[sales@finisar.com](mailto:sales@finisar.com)  
[www.finisar.com](http://www.finisar.com)