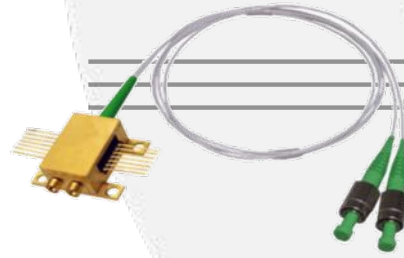




BPR-20-D



DEVICE

20 GHz Linear Balanced PhotoReceiver

OVERVIEW

The Optilab BPR-20-D series is a linear balanced photoreceiver with a configurable bandwidth up to 20 GHz. In a 14-pin mini-DIL package, BPR-20-D integrates a dual balanced PIN-photodiode (PD) array on a single chip and a linear Trans-Impedance Amplifier (TIA). It can be operated in either Manual Gain Control (MGC) mode or Automatic Gain Control (AGC) mode. Featuring differential conversion gain of 1500 V/W, an imbalanced response of less than 0.5 dB and a differential output voltage swing of up to 1200 mVpp, BPR-20-D is the idea receiver solution for DQPSK operating up to 48 Gbit/s or for low noise analog heterodyne detection. Excellent electrical and optical phase propagation is achieved by a total skew of lower than 5 ps between the balanced signal paths. Contact Optilab for more information.

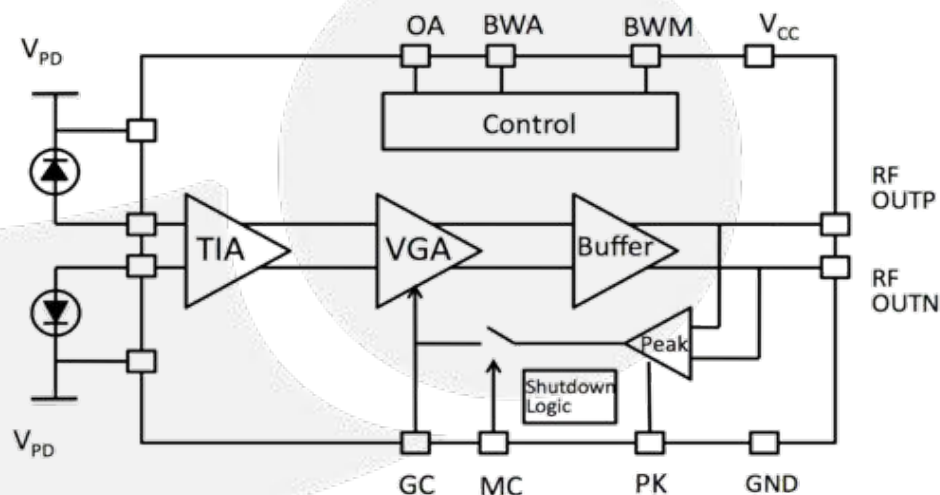
FEATURES

- Low skew, near ideal matching response
- Dual GPPO for differential RF output
- Adjustable bandwidth to 20 GHz
- Linear TIA with integrated VGA
- 14 pin mini-DIL package
- MGC and AGC mode

USE IN

- Balanced linear receiver up to 20 GHz
- Low noise analog heterodyne detection
- Transponder and line card designs
- 20 GHz analog RfOF link
- 48 Gbit/s DQPSK systems

FUNCTIONAL DIAGRAM





BPR-20-D

SPECIFICATIONS

Optimized Operating Wavelength	950 nm to 1650 nm
Optical Input Level	+ 4 dBm max.
S21 3 dB Bandwidth	20 GHz typ.
Dark Current @ 25°C, 3.3 V	5 nA typ.
Conversion Gain	1500 V/W typ., 1300 V/W min.
Imbalance of Conversion Gain	0.3 dB typ.
Optical Return Loss	30 dB typ.
Optical PDL @ 1550 nm	0.25 dB max.
PD Reverse Bias Voltage	3.3 V \pm 0.2 V
TIA Supply Voltage	3.3 V \pm 0.2 V
Output Return Loss	8 dB @ 20 GHz
Differential Output Voltage	Up to 1200 mVpp
Impedance	50 Ω
Output Coupling	DC (external AC coupling required)
Impulse Response	22 ps typ.
Skew	5 ps typ., 20 ps max.
Equivalent Input Noise Density	100 pA/ $\sqrt{\text{Hz}}$ max.

GENERAL

MECHANICAL

Operating Temperature	0°C to +75°C
Storage Temperature	-40°C to +85°C
Operating Humidity	85% max.
Supply Current	87 mA typ., 93 mA max.
Power Consumption	275 mW typ., 307 mW max.
Housing Dimension	18 mm x 22 mm x 8.5 mm
Fiber Connector	FC/APC or LC/APC
Optical Fiber	SMF-28
Package Type	14 pin butterfly min-DIL
RF Connector	Dual GPPD

ABSOLUTE MAXIMUM RATINGS

PD Reverse Bias Voltage	4.5 V
Input Optical Power	6 mW
Maximum Current	93 mA
Continuous Input Current	-1.5 mA to 5 mA
ESD, Input and Output Pins	1000 V min.
ESD, All Other Pins	2000 V min.
Latch Up	JESD78 Class 2
Humidity	85%



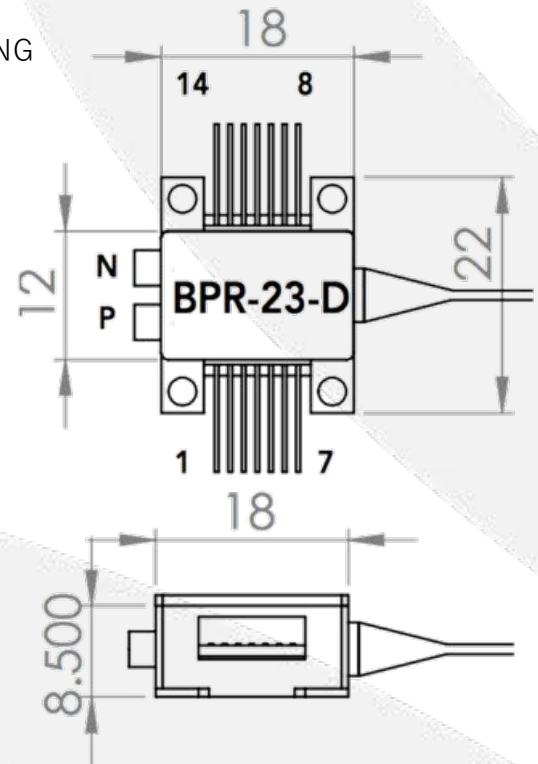


BPR-20-D

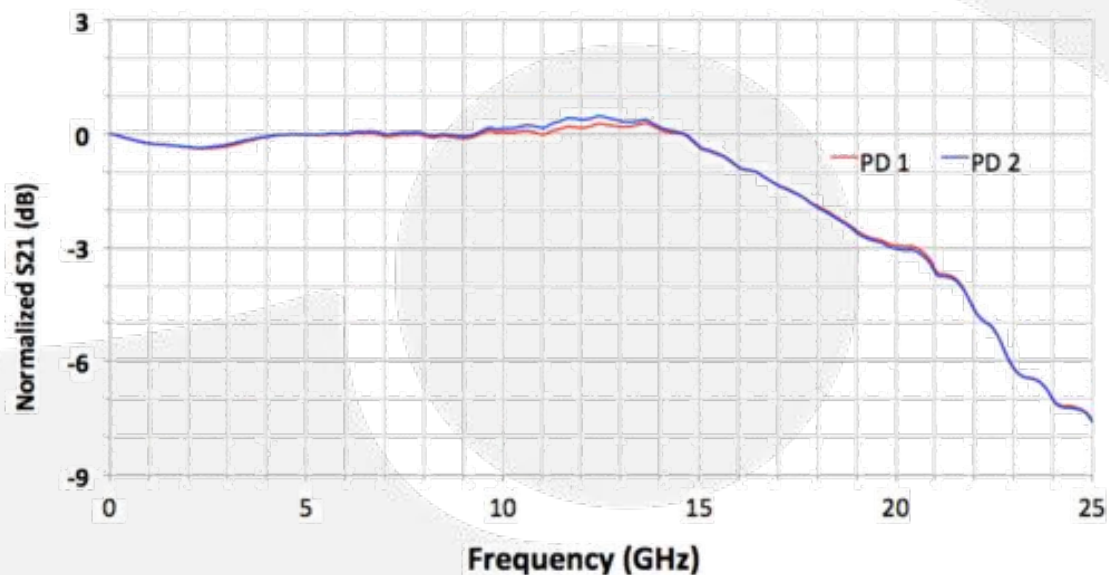
14 PIN BUTTERFLY PACKAGE

MECHANICAL DRAWING

Pin 1, 5, 10, 14	Vcc	+2.8 to 3.3 V, abs max current is 93 mA
Pin 2	BWM	Bandwidth Adjust, Sign.
Pin 3	BWA	Bandwidth Adjust, Magnitude.
Pin 4	OA	Output Amplitude Adjust. 0-3.3 VDC adjustment for AGC mode.
Pin 6, 9	GND	Ground
Pin 7	VPD1	PD1 Cathode Connection.
Pin 8	VPD2	PD2 Cathode Connection.
Pin 11	GC	Gain Control. 0-3.3 VDC adjustment for MGC mode. Set to FLT in AGC mode.
Pin 12	MC	Mode Control. GND: MGC mode; FLT: AGC mode; Vcc: Shutdown.
Pin 13	PKD	Peak Detector Output
	OUTP	Positive RF Output, DC coupled out
	OUTN	Negative RF Output, DC coupled out



DUAL CHANNEL S21 FREQUENCY RESPONSE





BPR-20-D

EVALUATION BOARD (BPR-20-EVAL)

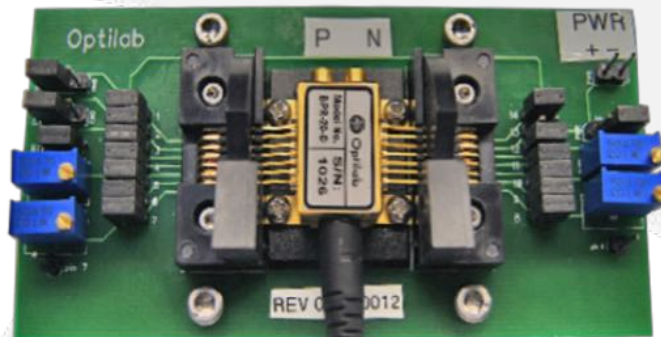
Evaluation board for the BPR is designed for ease of testing. It provides convenient access to all 14 pins and the data output ports. Utilizing a zero-insertion force configuration, the BPR can be mounted without the need for soldering. Different settings can be easily configured with the provided jumpers. The evaluation board can be powered up with a single +3.3V power with the provided power cable.

BANDWIDTH SETTING TABLE

BWM (Pin 2)	BWA (Pin 3)	Min. Bandwidth (GHz)
GND	Vcc	13
GND	FLT	15
GND	GND	16
FLT	FLT	18
Vcc	GND	20
Vcc	FLT	20.5
Vcc	Vcc	21

OPERATION MODE SETTING

Operation Mode	MC Setting (Pin 12)	Amplitude / Gain Adjustment
Manual Gain Control	GND	GC (Pin 11), 0 ~ 3.3V
Auto Gain Control	Floating	OA (Pin 4), 0 ~ 3.3 V
Shut Down	Vcc	N.A.



INTEGRATE MODULE (BPR-20-M)

For ease of installation, a fully integrated module BPR-20-M is available for ordering. Here are the features of BPR-23-M:

- Power and controlled via USB
- Integrated input power monitoring
- Integrated DC blocks
- MGC/AGC selection

