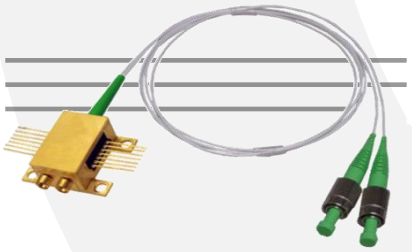
BPR-22-HS



DEVICE

22 GHz Linear Balanced Photoreceiver, Hermetically Sealed

OVERVIEW

The Optilab BPR-22-HS series is a linear balanced photoreceiver with a configurable bandwidth up to 22 GHz, hermetically sealed for component qualification standards. In a 14-pin mini-DIL package, BPR-22-HS 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-22-HS is the idea receiver solution for DQPSK operating up to 45 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. This is commercial grade only version, please contact Optilab for Space Qualification.

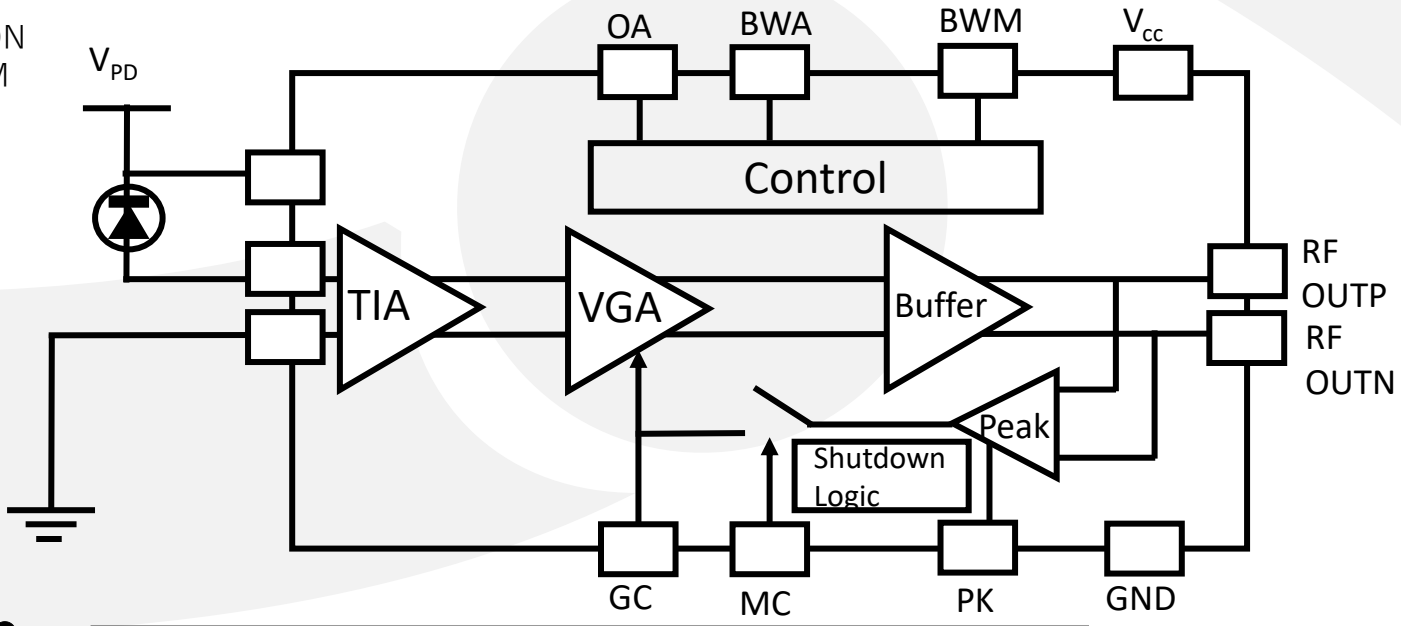
FEATURES

- Adjustable bandwidth of 22 GHz
- Very low skew, near ideal matching response
- Linear TIA with integrated VGA
- 14 pin mini-DILL package
- Dual GPPO for differential RF output
- MGC and AGC mode

USE IN

- Balanced linear receiver up to 22 GHz
- Low noise analog heterodyne detection
- 45 Gbit/s DQPSK systems
- Transponder and line card designs
- 22 GHz analog RFoF link

FUNCTION DIAGRAM



BPR-22-HS

SPECIFICATIONS

Optimized Operating Wavelength	950 nm to 1650 nm
Optical Input Level	+4 dBm max.
S21 3 dB Bandwidth	20GHz typ
Dark Current @ 25°C, 3.3V	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 ± 0.2 V
TIA Supply Voltage	3.3 V ± 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/√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 Dimensions	18mm x 22mm x 8.5mm
Fiber Connector	FC/APC or LC/APC
Optical Fiber	SMF-28
Package Type	14 pin butterfly min-DIL
RF Connector	Dual GPPO

ABSOLUTE MAXIMUM RATINGS

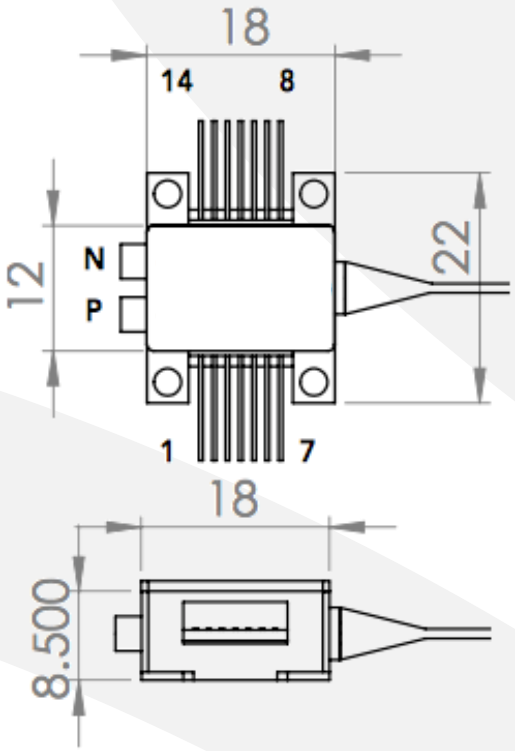
PD Reverse Bias Voltage	4.5 V
Input Optical Power	6 mW
Maximum Current	93 mA
Continuous Input Current	-1.5 mA to 5 mA
ESD, Input and Output Pins	1000 V min.
ESD, All Other Pins	2000 V min.
Latch Up	JESD78 Class 2
Humidity	85%

BPR-22-HS

14-PIN BUTTERFLY PACKAGE

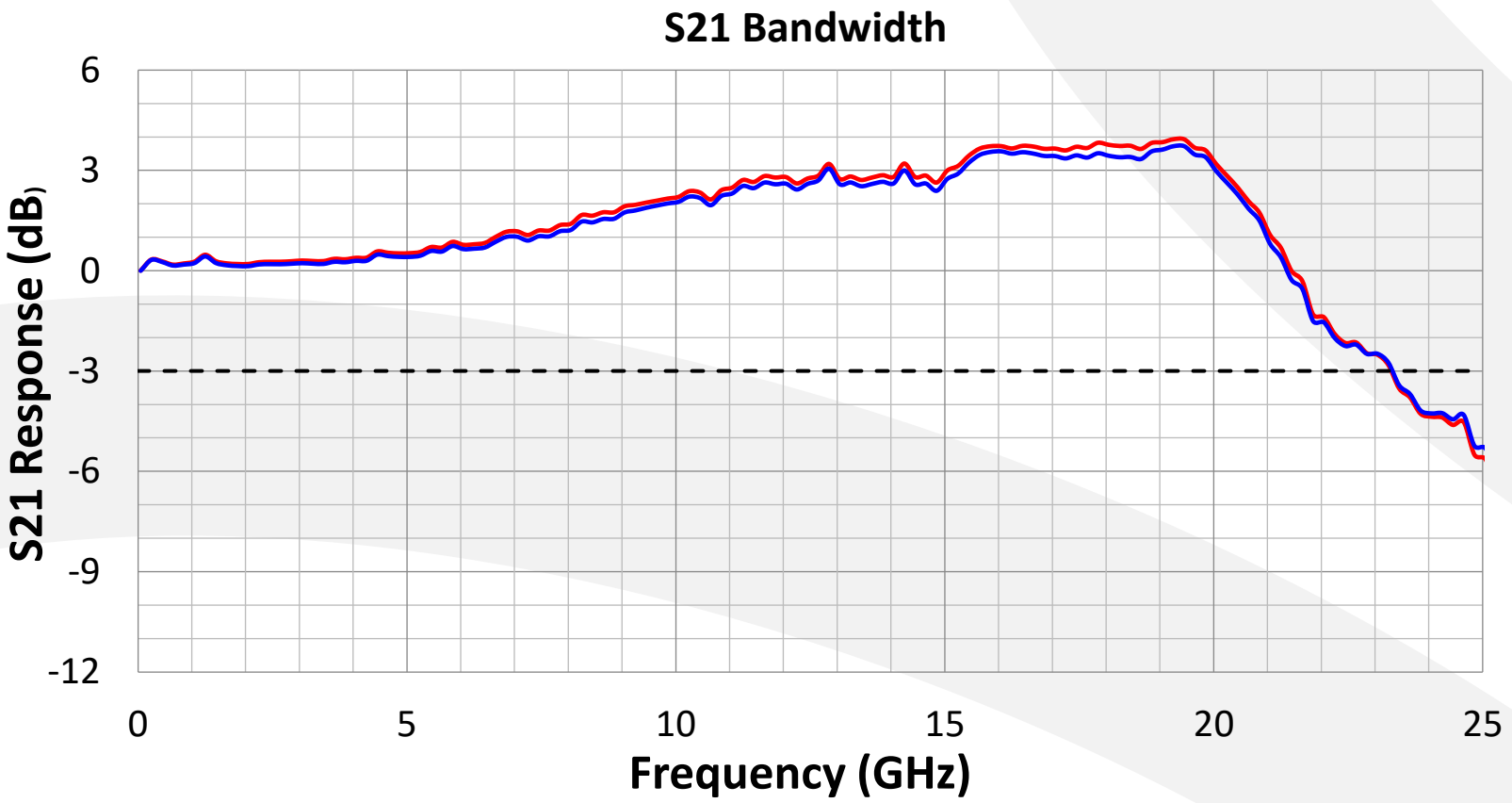
Pin 1	Vcco	Output Vcc, 3.3 +/- 0.2 V
Pin 2	BWH	Bandwidth Corse Adjust
Pin 3	BWL	Bandwidth Fine Adjust
Pin 4	OA	Output Amplitude Adjust in AGC mode. Adjust range from GND to Vcc. Set to Float in MGC mode.
Pin 5	Vcci	Input Vcc, 3.3 +/- 0.2V
Pin 6, 9	GND	Ground
Pin 7	VPD1	PD1 Cathode connection
Pin 8	VPD2	PD2 Cathode connection
Pin 10, 14	NC	Not connected
Pin 11	GC	Gain control in MGC mode. Adjust range from GND to Vcc. Set to Float in AGC mode.
Pin 12	MC	Mode control. GND: MGC mode; Floating or Vcc: AGC mode.
Pin 13	PKD	Peak Detector Voltage Output
P	OUTP	Positive RF Output, require external AC coupling
N	OUTN	Negative RF Output, require external AC coupling

MECHANICAL DRAWING



BPR-22-HS

DUAL CHANNEL S21 FRQUENCY RESPONSE



BPR-22-HS

EVALUATION BOARD (BPR-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 ~3.3 V
Auto Gain Control	Floating	OA (Pin 4), 0 ~ 3.3 V

INTEGRATED MODULE (BPR-22-HS-M)

For ease of installation, a fully integrated module BPR-22-HS-M is available for ordering. Here are the features of BPR-22-HS-M :

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